October 4, 1948

STEEL

The Magazine of Metalworking and Metalproducing

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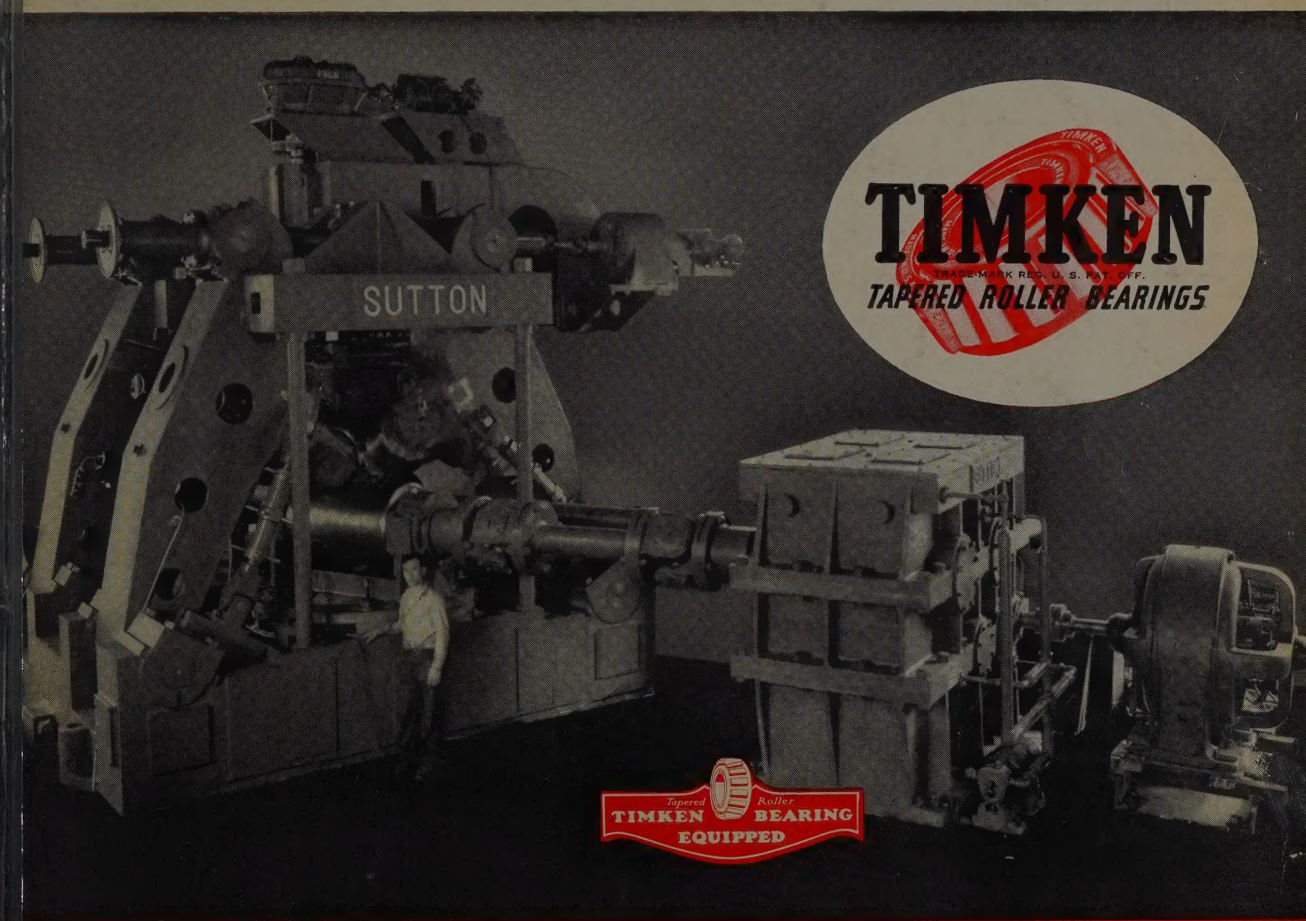

Giant Sutton Straightener Uses 40 TIMKEN® BEARINGS

Said to be the largest straightening machine ever built, this massive piece of equipment straightens seamless tube 18½" O.D. with ⅝" wall and 18½" O.D. tube with 1¼" wall in which the yield points are not over 90,000 pounds and 45,000 pounds respectively. It also straightens solids up to 12" diameter. Straightening speed, 50-200 feet per minute at 300-1200 R.P.M.

The Sutton Engineering Company has used Timken tapered roller bearings in its straightening equipment for many years and has proved their many benefits. That's why they have used them so liberally in this new machine — on main roll necks, idler rolls, motor pinion shaft, intermediate pinion shaft, main pinion shafts and universal joints. They know it pays — and so do their customers. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address "TIMROSCO".

JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ⓞ AND THRUST →ⓞ← LOADS OR ANY COMBINATION →ⓞ

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IT MEANS: 1) *Better, Faster Service.* Independent local repair shops are now being selected and authorized to service and repair Allis-Chalmers Motors, Transformers, Controls, Pumps — and "Certify" them as to workmanship.

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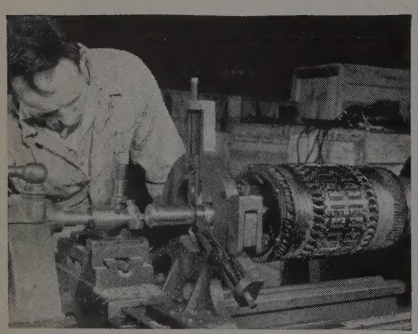
How can you get this service? For the present most "Certified" Service Shops are located in the larger U. S. industrial areas . . . but they're expanding rapidly. Call your nearby A-C District Office or Authorized Dealer for closest recommended shop. ALLIS-CHALMERS, MILWAUKEE 1, WIS.

FINER, FASTER, FRIENDLIER SERVICE FOR INDUSTRY!



The A-C Supply Company of Cuyahoga Falls, Authorized Allis-Chalmers Dealer and newly-appointed "Certified" Service Shop, is staffed and equipped to give prompt, efficient, top-quality repair and service aid to customers in the greater Akron industrial area. Typical of the kind of "Certified" Service organizations being selected throughout U.S.

MANY SIZES, RATINGS OF ALLIS-CHALMERS STANDARD SQUIRREL-CAGE MOTORS ARE NOW AVAILABLE FROM STOCK. CHECK YOUR AUTHORIZED A-C DEALER, OR DISTRICT OFFICE FOR DETAILS.

A 2506

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Research keeps
B.F.Goodrich
FIRST IN RUBBER

He makes a belt better by throwing a piece away

A typical example of B.F.Goodrich product improvement

DID you know that 90% of all open-end transmission belt breakdowns are caused by fastener failures?

In 9 out of 10 cases of belt failure B.F.Goodrich belt engineers found fasteners had broken, pulled out, torn the belt ends. Just any old splice wouldn't work—the flexing round the pulleys opened ordinary splices. They solved the problem by throwing away a piece of the belt.

B.F.Goodrich men developed the patented Plylock splice. Back from one end, for a few inches, they cut out one inside ply. Into this depression the outside plies are laid. They covered the joint with bias-laid fabric and cured it with a portable vulcanizer that can be set up right on the belt drive.

Belts joined this way last more than 3 times longer than the average belt joined with metal fasteners. Plants using the Plylock splice report belt costs reduced as much as 75%, that pulleys last longer, shutdowns are eliminated, maintenance reduced, and a smoother drive obtained.

Any transmission belt can now be made endless right on its machine, saving hours and sometimes days of machine time. No dismantling of machinery is necessary. Plant interruptions are held to a minimum.

B.F.Goodrich distributors make the Plylock splice in their shops or on your machines; or they will instruct your mechanics in making it. Ask your local distributor or write: *The B.F. Goodrich Company, Industrial Products Division, Akron, Ohio.*

Plylock Belt Joint
by
B.F.Goodrich
FIRST IN RUBBER

Behind the Scenes...

New Man in Chicago

We always try to keep on top of changes in our own editorial staff, but doggoned if we didn't get skewped on an important move last week. Howard Tuttle, who has been covering news and market information here in Cleveland, moved out to Chicago last week, and from now on you folks in the Windy City should be on the lookout for him. He'll be covering the news beat out there. Erle Ross, who has been in Chicago since 1940 has been appointed Chicago engineering editor. That important metalworking area has expanded to beat the band, so we have had to expand our pipeline to match.

Ford's Our Friend

The Ford Motor Co. paid us a little compliment the other day, in its dealer publication. They were telling the story of the tremendous publicity given to the new Ford, and showed a few examples. Out of the thousands of papers and magazines that carried the story, fourteen were singled out, and prominent in the layout was our front cover and a reproduction of Detroit Editor Art Allen's page, "Mirrors of Motordom", which carried the Ford story. Right up there, we were, along with such other important papers as *Life, New Yorker,* etc., etc. We're grateful, of course, for the recognition—but it's perhaps not at all surprising to you readers who have known all along that the latest and most authentic news from the automotive industry is always to be found in Mirrors of Motordom.

Plant Photos

A couple of issues back we asked for pictures of unusual plants in our industry, and we will repeat the offer today, together with a photo of the first one in. It's from the Majestic Mfg. Co., St. Louis, and is a drawing of their brand new plant, which we will have to agree doesn't look like some of the stove plants we've seen. Here's one manufacturer whose plant has been streamlined as well as its products. We'll be glad to run photos of any other out-of-the-ordinary plants, so send them along.

Cousin Utah

Our relatives are always getting their names in the papers, usually in some connection where they don't belong. Little Shrdlus are always being born, getting married, or something of the sort. From out in Utah comes the latest addition to our collection, where C. E. Beveridge noticed one of our cousins playing fullback for the Carbon (Utah) High school. Cousin Utah Shrdlu ought to be a very deceptive man, being able to slip in practically unnoticed right under the very eyes of men who are always on the lookout for him.

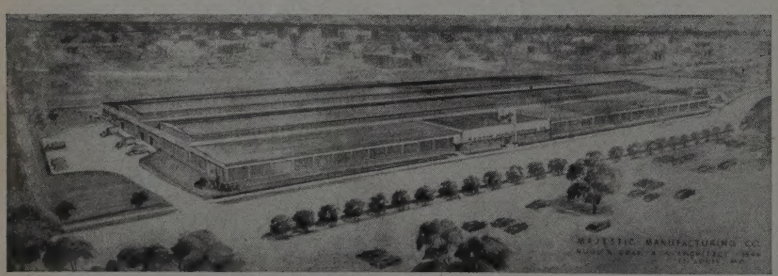
Index Available

Copies of our index for the first half of this year are now available. As before, it's a four-way job, containing the regular alphabetical index, a topical index, an index of all companies mentioned in STEEL during the period, and a list of all authors, together with their articles and page references. Be very happy to send you a copy or copies, if you'll drop us a line.

Note To Our Friends

In case Cleveland is still in the pennant race when you read this, don't write in here for tickets. We fell asleep in the line at the Cleveland postoffice last Monday night and our order wasn't postmarked until 12:30. There were at least 498,000 orders postmarked before that, and the Cleveland Stadium only seats 83,000 with shoe-horns attached, so you figure it out.

Shrdlu



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Vol. 123—No. 14 October 4, 1948

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STEEL

The Magazine of Metalworking and Metalproducing

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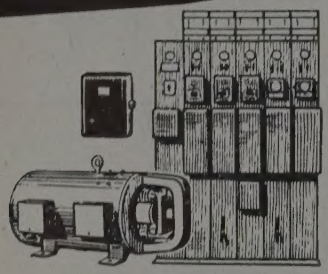

INDUSTRIAL-TRUCK BATTERY-CHARGERS

In 1910, The Electric Products Company introduced the first Automatic Battery Charger.

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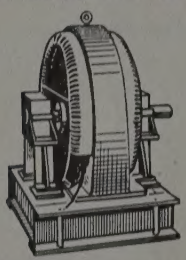

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From stator frame to rotor windings, E.P. Specialization is your guarantee of long life and trouble-free operation.

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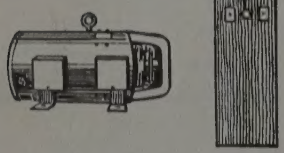

STANDBY BATTERY-CHARGERS

Diverter-Pole Motor-Generators assure maximum battery life, full-automatic operation and protect themselves against harmful overloads.

ASK FOR BULLETIN 207

also
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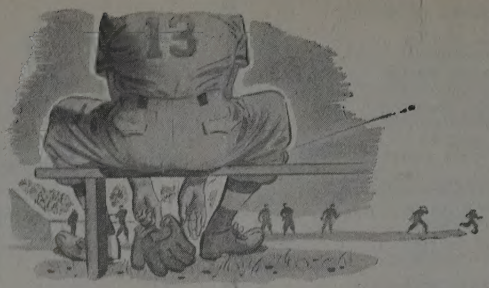
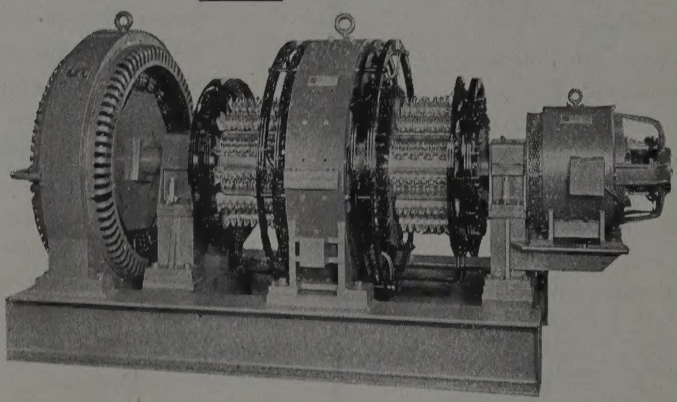
SPECIAL MOTORS AND GENERATORS
FREQUENCY CHANGERS
SYNCHRONOUS GENERATORS



THE *"FIRST STRINGER"* IS ALWAYS BETTER

. . . use an EP motor-generator



ENDURANCE, specialized ability and ruggedness . . . these are the three chief differences between the "first stringer" and the "bench-warmer." And they are the main reasons why the E.P. Motor-Generator has been chosen to supply hundreds of thousands of direct-current amperes throughout the metal-working industry for electroplating, electrocleaning, electrotinning, electrogalvanizing, electropolishing and anodizing.

Continuous duty for over twenty years is common for an E.P. Motor-Generator. Tailor-made for the specific electrolytic process, it assures economies unmatched by ordinary commercial machines. Unaffected by the corrosive atmospheres common to most electrolytic operations, it requires no special protective equipment. There's no production "time-out" with an E.P. Motor-Generator.

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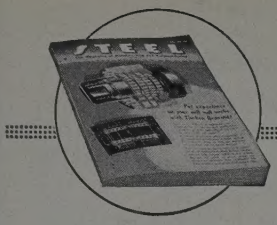

October 4, 1948

Life Insurance

Research and Policy Committee of the Committee for Economic Development has just issued a report entitled "Small Business: Its Place and Problems" by A. D. H. Kaplan. Two of the conclusions drawn from the report are of special interest to the metalworking industries.

The first is that the number of small businesses in the country today, per thousand of population, is as large as at any time in our history and that numerically there is no downward trend in sight. The second is that while small business has maintained its strength in numbers, it has lost some ground in the proportion it does of the nation's business.

It is impossible to write a formula which would determine the balance between large and small units of industry that would be healthiest for the economy of the nation. Nevertheless it is safe to say that it is highly desirable that the number of small businesses shall not shrink in the relation to the number of large businesses and that the proportion of business done by the small concerns shall not shrink in relation to that done by the corporate giants. Should the companies of modest size lose ground steadily both as to number and as to volume, then the inevitable result would be an industry composed of companies so large and so powerful that the federal government would have to regulate most of its activities. From such regulation to government ownership would be but a short and easy step.

Mr. Kaplan's report stresses three correctives that would help small business to improve its position. They are better management, greater availability of equity capital and an improved long range program of federal taxation. Each of these is tremendously important and there should be no let up in the efforts now being made toward improvement in these directions.

One other thing is needed. It is a better realization on the part of leaders in government and in industry of the cold fact that if obstacles in the path of small entrepreneurs become too difficult and if small business loses too much ground quantitatively and qualitatively, the ultimate result will be painful for everybody. Prosperity among competent small businesses is excellent life insurance for big businesses.

* * *

SPIRIT STILL STRONG: Securities and Exchange Commission and Department of Commerce estimate that American business, exclusive of agriculture, is spending $4.7 billion for plant and equipment during the fourth quarter. This is off only slightly from the amount spent in the final quarter of 1947.

This reflects management's solution of a difficult problem. In some metalworking industries the pressure of demand calls for a marked expansion in plant and equipment. Under conditions of an ample supply of materials and equipment and of fairly reasonable costs, most executives would have no hesitancy in going ahead with large expansion programs. However, many important materials and types of equipment are not available and their costs are fantastic. One may have grave doubts as to whether or not a new plant started now at today's costs could produce goods when completed at a price consumers would pay in what probably will be a buyers' market.

Doubts of this kind have plagued every company that has contemplated expansion. In

(OVER)

some instances plans for new projects have been abandoned. In others those who launched expansion programs some time ago and have discovered that costs will far exceed original estimates, would like to call a halt but cannot because it now would cost more to stop than to go ahead.

The mere fact that in spite of these discouraging factors business is gambling almost $5 billion quarterly on new facilities is pretty good evidence that the venturesome, enterprising spirit of American industry still lives. —p. 50

* * *

NIP AND TUCK ON ORE: This is the time of year when persons responsible for mining and shipping iron ore begin to take stock of their season's performance. The perennial question is whether shipments during the period of navigation will have increased stocks at lower lake ports and at furnaces sufficiently to supply the steel industry until the carriers ply the lakes again next spring.

This year the question is especially pertinent because of the sustained high level of iron and steel production. Shipments have been heavy, with the result that stocks at lower lake ports are somewhat above those of some recent years. Nevertheless, the needs of ore for current steel output are so great that stocks that once were considered more than ample now can be questioned.

All in all, it looks as if the supply will measure up to demand, barring unforeseen setbacks. It still is a nip and tuck proposition, with the odds in favor of success. —p. 45

* * *

ORDERLY ADJUSTMENT: Reports from 45 metalworking companies show that sales and earnings in the second quarter of 1948 were up moderately from the preceding quarter and up substantially from the second quarter last year. While this gain is due partly to inflation, percentage of earnings to sales declined only slightly from 6.39 for the second quarter last year and from 6.48 for the first quarter of 1948 to 6.37 for the second quarter of 1948.

That sales and earnings for the third quarter may ease only moderately from those of the second quarter is indicated by reports to purchasing agents on new orders in September. About 30 per cent of the companies reported a decline, 52 per cent no change and 18 per cent increases.

These are signs that on the average business activity is leveling off. The averaging obscures the fact that while some companies are going stronger than ever, others are really hard hit. —pp. 46, 51

* * *

FREEDOM TO INVEST: Address of President Gwilym A. Price of Westinghouse at the Detroit convention of the American Bankers Association again emphasizes the precarious situation of industry in regard to equity capital.

In 1947, he declares, only 2 per cent of the record total of capital expenditures was paid for by the sale of new common stock. The remaining 98 per cent came from business profits and from the sale of indebtedness.

This is really shocking. As former President Herbert Hoover pointed out recently, if this condition continues much longer, we will soon come to the point where the federal government is the sole source of funds for capital investment.

What the nation needs is a government policy regarding taxes and numerous other factors which will restore to American citizens their traditional freedom to invest part of their savings in business enterprises. —p. 50

* * *

RELIABLE AND SAFE: Chain is a product that has received a minimum of publicity in relation to the important role it plays in the life of the nation. Most people take chain for granted, accepting it as something that is always available and without realizing that it, like most other articles made of iron or steel, constantly is being improved to meet more exacting requirements.

At the turn of the century practically all chain was made by hand on the anvil. The stock was hammered to shape and lap-welded. Today most chain is made by machine. The stock is shaped automatically and butt-welded electrically. With mechanization have come refinements in metallurgy, specifications, testing and inspection. Today one can know with certainty just what physical characteristics he can expect from chain purchased to meet precise specifications.

This has resulted in a degree of reliability and safety of which modern chainmakers can be proud. —p. 76

E. L. Shaner

EDITOR-IN-CHIEF

Call Ryerson for Allegheny Stainless

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When problems of heat or corrosion resistance call for stainless steel, it will pay you to call Ryerson for Allegheny Stainless. You get quick shipment of any quantity. The same prompt, personal service whether you need a single piece for test installation or a carload.

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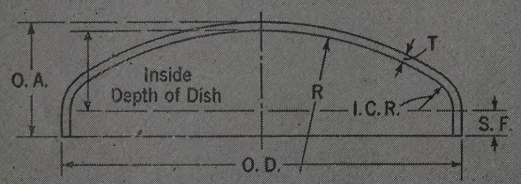

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R in inches
I.C.R. in inches
S.F. in inches } *specify more important*
O.A. in inches } *dimension, not both*

Quantity
Special tolerances, if any
Trimming or machine work, if any

WHEN IS A HEAD A *Head-Shape*

Builders of boilers, tanks and pressure vessels identify the various types of heads as Flanged and Dished, Elliptical Dished, and so on through a long list of names. But thousands of Lukens Heads are bought because their shape suits them to other uses; hence, our term "Head-Shapes".

Serving as machine guards and housings, as floor fan and table bases, electric motor end bells, concrete mixer drums, gear webs and other parts of machinery—Lukens Head-Shapes are the semifinished product with which such builders start.

Designers may find the basic shape they need among the standard head-shapes described in Lukens Manual No. 1, "Flanging & Pressing"; details on 3,868 different "heads" are given. Dimensions can be transferred right to your drawings, thereby insuring quicker shipment, eliminating die costs and saving you money in other ways. Bulletin 433, "Heads in a Hurry", lists the carbon steel heads regularly stocked and ready for shipment.

For copies of these publications and for prices, write Lukens Steel Company, 414 Lukens Bldg., Coatesville, Pennsylvania.

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• • SPEED SCRAP TO THE MILLS TO MAKE MORE STEEL • •

News Summary

ORE OUTLOOK— Blast furnace operators should be in slightly better position as regards iron ore supplies this winter than they were last. Shipments during the current season are expected to exceed 82 million tons, presaging a carryover of 18 million tons next April, 2 million tons more than last April (p. 45). Although these stocks are not as large as desired and although five new blast furnaces and several reconditioned stacks will be drawing on Lake Superior ore, the stocks likely will be enough to keep all furnaces in blast. Aiding the pig iron production outlook is an improved supply of coking coal, due to a generally improved coal supply and to installation of washing plants (p. 46).

METALWORKING EARNINGS— Sales of metalworking companies in the second quarter this year continued to rise. Net earnings edged up slightly, although not keeping pace with the sales increase (p. 51). Sharply increased wage and materials costs, outrunning price increases, caused the ratio of profits to sales to decrease.

VENTURE CAPITAL SHORT— Present taxation policies are blamed for the scarcity of venture capital going into industrial expansions and new enterprises. Of $26.5 billion expended for expansion and modernization in 1947, only $1.25 billion was venture capital, the remainder coming from accumulated profits, bank loans, bonds and other forms of indebtedness (p. 50). Investment of private capital in Latin American enterprises also is lagging (p. 52), due to uncertainty as to the safety of such investments.

IRON, STEEL SHOW— Nearly 300 exhibits of equipment of primary interest to iron and steel men were shown at the biennial exposition of the Iron & Steel Engineers in Cleveland last week. These included the new x-ray thickness gage, new control, communications, cutting, lubrication and many other types of equipment (p. 48).

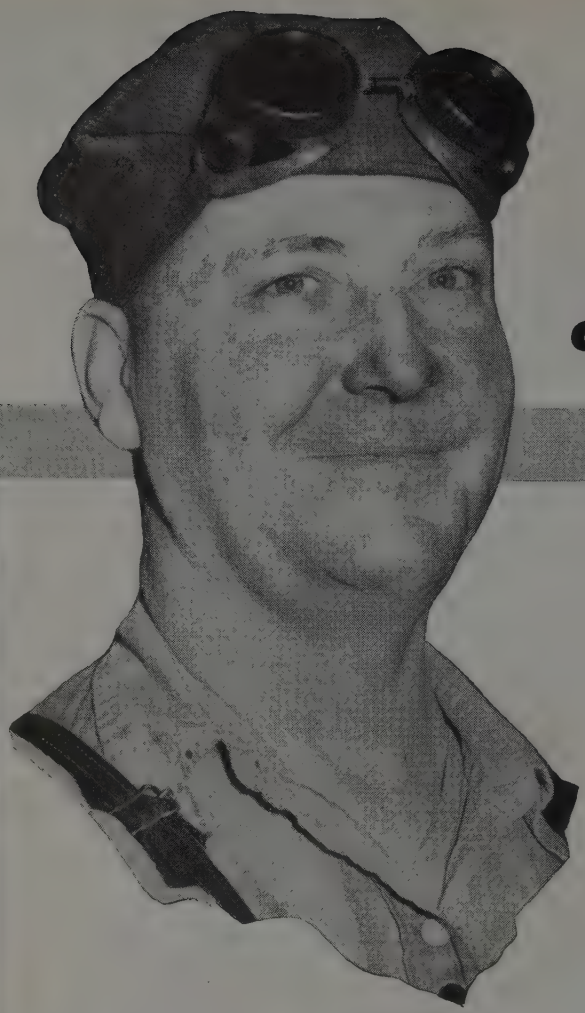
STEEL IN EUROPE— German steelmakers hope to persuade American industrialists visiting the Ruhr that an increase in steel prices is necessary to stimulate production (p. 55) for use in the recovery program. They contend German prices currently are lower than those in neighboring countries. . . Pressure for nationalization of the British steel industry continues despite the good showing being made by private management (p. 55).

EXPORTS— Contrary to predictions that the European aid program would cause exports of ferrous materials to rise sharply, figures for July show that shipments abroad are declining, a trend which has been noticeable since the first of the year (p. 56). For the first seven months, ferrous metals exports totaled 2,777,598 net tons, about 7½ per cent of total finished steel shipments.

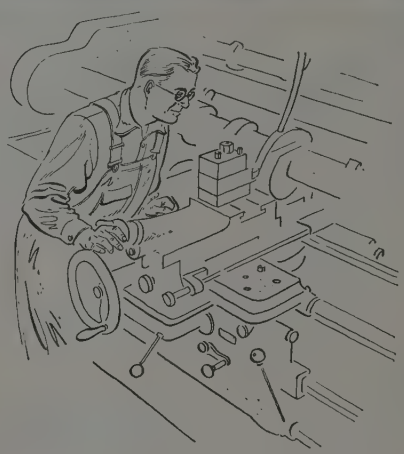
GM REDESIGNS BODIES— General Motors has significant body changes in the works for all its lines of passenger cars (p. 59). Essentially the new bodies will fall into two series, one for the light cars and one for the larger models, with adaptations to give a different appearance. This will continue the economies that GM has enjoyed in body manufacture.

HERE AND THERE IN INDUSTRY— Republic Steel in converting another blast furnace to high top pressure (p. 46), expects to gain 20 per cent in production . . . Kaiser will build a new blast furnace (p.46) at his Fontana plant . . . Additional 8 per cent increase in rail freight rates will be asked by the carriers (p. 47) . . . Aluminum Co. of America is being asked to divest itself of plant and properties to satisfy a monopoly judgment obtained by the government (p.51) . . . Controls over prices and materials tend to cause inflation, according to H. W. Prentis Jr., (p. 57) . . . Automakers are receiving plenty of gripes (p. 59) regarding the sales practices of their dealers, but find policing a difficult job . . . Construction of the first atomic pile to be used specifically for the production of electric power is scheduled to start next spring (p. 62) . . . Bureau of Mines is spending a substantial portion of its funds in the developing (p. 52) of marginal and submarginal minerals deposits.

Engineering News, p. 73 *Market Summary, p. 129*



"I Like the UNIFORMITY of Inland Steel"



THE MEN WHO WORK WITH INLAND STEEL KNOW ITS QUALITY

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STEEL
A PENTON PUBLICATION

Winter Ore Stocks Up Slightly

Carryover at lower lake docks and furnaces next spring to be two million tons larger than in 1948. Season's total shipments to exceed 82 million tons

IRON ore supplies at the 190-odd blast furnaces smelting the Lake Superior product may be a shade easier in the spring of 1949 than they were last April.

This is the consensus of ore shippers as they enter the final lap of the current shipping season. Prospects are for a total movement of 82 million tons or better this year. At estimated consumption rates, taking into consideration the several new stacks using Lake Superior ore, the carryover of ore at lower lake docks and furnaces next Apr. 1 should be about 18 million tons, or 2 million tons more than on Apr. 1 this year.

Such a spring carryover estimate permits no complacency. It is considerably less than what blast furnace operators would like. Possibly next spring's stocks will be so low as to necessitate some transfer or trading to obtain needed grades of ore; possibly even some all-rail shipments will be required to augment dwindling stocks before the lake shipping season opens.

However, the prospect of 18 million tons of ore on hand next April dissipates the spectre of blast furnaces idle for want of ore.

Shipments Ahead—Shipments of ore to Oct. 1 amounted to about 65 million tons, or 3.5 million tons more than had been moved at the same date last year.

Stocks on hand at lower lake docks and furnaces aggregated 40 million tons, against 38.3 million tons on Oct. 1, 1947.

During October, November and the early part of December, at least 17 million tons more will be delivered at the lower lakes. Given a break on the weather, this estimate may be exceeded by a million or more tons.

Shipments on the lake, however, may be expected to dwindle during the remainder of the season. Weather will play an increasingly important role in lake shipping.

A substantial portion of the bulk fleet will transfer this month from the ore to the grain trade. Independent fleet operators especially have fulfilled their ore-carrying contracts and will be looking for wheat cargoes, which offer a higher revenue. Possibly 50 to 60 of the 263 vessels engaged in carrying ore will be carrying grain within the month.

Consumption Down—Iron ore consumption for the first eight months trailed use in the comparable 1947 period by 1,168,187 tons, 51,856,701 tons being smelted this year against 53,024,888 tons in 1947. Consumption touched 7 million tons in August for the first time since January. The lag in consumption is attributable to the necessity of blast furnace repairs, delayed through the war and early postwar period, and to scarcity of suitable coke. The coal strike in April, of course, caused a sharp dip in consumption.

With some furnaces returning to operation and several new stacks in operation, monthly consumption during the winter months may hover around the 7 million-ton mark.

New Blast Furnaces Added

FIVE new bast furnaces and several long-idle stacks will be drawing on Lake Superior ore stocks this winter, increasing ore consumption substantially.

New stacks include:

Pittsburgh Steel Co.'s furnace at Monessen, Pa., lighted last spring.

Carnegie-Illinois stacks Nos. 11 and 12 at South Chicago.

Youngstown Sheet & Tube's new 1400-ton stack at Indiana Harbor, lighted Sept. 17.

Ford Motor Co.'s "C" furnace at the Rouge plant, which will be completed about Nov. 1 and blown in about two weeks later.

Long-idle stacks returned to production include two Mingo furnaces, purchased by Wheeling Steel from Carnegie-Illinois in 1946 and modernized by Wheeling. One was lighted late in July and the second is scheduled to go in late this month. Colo-

More than 82 million tons of iron ore will be moved down the lakes during the shipping season, just about the tonnage that is consumed in a year. Furnace operators expect to have enough, but none to spare, when next spring rolls around. Shown is the WILLIAM A. IRVIN *of the Pittsburgh Steamship fleet, locking through at the Soo*

rado Fuel & Iron Corp.'s "X" furnace at Buffalo was returned to blast several weeks ago after being idle for repairs.

Coking Coals Improve

SCARCITY of good quality coking coal, which has restricted blast furnace operations since the beginning of the war and especially in the postwar period, shows definite signs of easing.

Improvement is due to (1) the substantial betterment of all coal supplies resulting from fairly sustained production, and (2) increase in coal washing equipment.

However, plenty of room still exists for improvement in the quality of coking coals.

Ash and sulphur contents of coal have increased in recent years, mainly for two reasons: 1. Coal mining has been mechanized which generally has necessitated mining the entire seam rather than selected parts; 2. lower-grade deposits are being worked, as the higher-grade seams are exhausted.

Coal washing installations at many mines are helping to remove part of the ash and sulphur contents, but these still remain higher than a few years ago.

The sharp increase in available coal is enabling coke oven operators to be more selective in the material they use.

Kaiser To Build New Furnace

A NEW 1200-ton blast furnace will be constructed by Henry J. Kaiser at his Fontana steel plant. The stack, to cost $17 million, will be privately financed.

Fontana's coke plant, utilities and other equipment also will be enlarged.

Kaiser has entered into a contract with Transcontinental Gas Pipe Line Co. to supply a half million tons of steel plate, at a cost of $60 million, to be used in fabricating pipe for a natural gas pipeline from Texas to New York. Pipe will be fabricated in the Los Angeles district. The plate contract is the immediate reason for building the blast furnace, Fontana's second. Kaiser has under construction a seventh open hearth at Fontana.

Republic Converts Warren Stack

REPUBLIC Steel Corp. has converted its Warren, O., blast furnace to "high top pressure" and the stack is back in production after a 10-day shutdown for conversion. The new operating technique is expected to raise the capacity of the stack from 1275 tons daily to 1500 tons.

Republic now is using pressure blowing technique in blast furnaces at Cleveland, Chicago and Youngstown, in addition to Warren, and soon will convert a stack at Buffalo.

A new turbo blower has been installed at Warren to provide 125,000 cu ft of air per minute at pressures up to 40 lb per sq in.

Labrador Promises Rich Ore

CONCERN over the dwindling reserves of high-grade ores in the Lake Superior district has intensified interest in two types of projects to assure a continuing supply of metallics: 1. Processes to beneficiate low-grade ores and iron-bearing rock in this country; 2. exploration and development of ore fields in neighboring countries.

Work on beneficiation of taconite, the abundant ore-bearing rock of the Lake Superior district, is progressing steadily with all the important ore interests and steelmaking companies holding some stake in the experimental and development work.

Various exploration and development programs are under way in Mexico and several South American countries and these fields may supply substantial tonnages of ore for United States blast furnaces in future years.

Labrador Best Bet—But the project that has caught the imagination of the steelmaking fraternity as well as the general public is the exploration underway in the Labrador-Quebec area.

Here several hundred thousands of tons of high-grade ore already have been proved; the promise is held that the Labrador deposits may equal or exceed those of the Mesabi range.

Much of the ore tests 60 per cent or more iron; some runs as high as 70 per cent. It is low in phosphorous and silica, and high in manganese.

Hope for 20 Million Tons Yearly—Trail blazers in the Labrador exploration are the Hollinger-Hanna interests—Hollinger Consolidated Gold Mines Ltd., Canadian gold mining company, and M. A. Hanna Co., large iron mining operator of Cleveland.

Production of the Labrador ore is not likely to start on a commercial basis for five years, although this estimate probably could be shaved if time became more important than money—in case of war, for example.

Present plans call for hauling out 10 million tons of ore at first and gradually increasing output to 20 million tons annually. (This would compare with shipments of more than 80 million tons from Lake Superior this year.)

Completing New Finishing Mill

SUPERIOR Steel Corp., Carnegie, Pa., expects to have in operation by Jan. 1 a 5 stand 4-high, 20-in. finishing mill, rated at 12,000 tons a month. This mill is being built by E. W. Bliss Co. and will reduce strip from 0.050 to 0.200 at top speed of 2000 feet per minute.

This unit has been specially designed for stainless, clad metal, alloys and spring steels, and it is expected to replace the company's 10 and 14-in. hot mills.

PIG IRON AND FERROALLOY PRODUCTION FOR AUGUST AND YEAR TO DATE

Blast Furnace Capacity and Production—Net Tons

	No. blast furnaces reported	Annual blast furnace capacity	Production							
			Pig Iron		Ferro manganese and spiegel		Total		Percent of capacity	
			Current month	Year to date	Current Month	Year to date	Current month	Year to date	Current month	Year to date
Distribution by Districts										
Eastern	11	13,093,560	988,676	7,163,839	32,474	229,699	1,021,150	7,393,538	92.0	84.7
Pittsburgh-Youngstown	17	25,588,120	2,068,259	15,191,829	13,068	162,957	2,081,327	15,354,786	96.0	90.0
Cleveland-Detroit	6	6,495,000	521,352	3,899,345	-	-	521,352	3,899,345	94.7	90.0
Chicago	7	14,700,290	1,088,394	8,009,707	-	10,190	1,088,394	8,019,897	87.4	81.8
Southern	8	4,949,660	374,204	2,907,646	4,866	60,968	379,070	2,968,614	90.4	89.9
Western	3	2,612,300	163,319	1,479,905	-	-	163,319	1,479,905	73.8	85.0
Total	35	67,438,930	5,204,204	38,652,271	50,408	463,814	5,254,612	39,116,085	92.0	87.0

How's Business?

Purchasing agents note slackening in orders, decline in backlogs. Buying caution increases

WHILE production increased in September, expectations that the month's business would show a marked tendency to expansion was not confirmed by reports to the Business Survey Committee of the National Association of Purchasing Agents.

Backlogs are noticeably down, the committee reported, 30 per cent of the purchasers contributing to the survey noting a falling off in orders. There remains, however, a substantial bolster of back orders in most industries.

Prices Still Rise—Prices continued to advance in September, but the momentum now appears spent.

Price advances last month included: aluminum products, bichromate, cadmium, capital equipment, chemicals, cutting tools, soybean oil, meat, glassware, glue, lime phenol, rubber, spiegeleisen, turpentine.

Declines were reported on: alcohol, brass ingots, coal, cornstarch, corrugated boxes, cotton twine, elastic webbing, grains, eggs, sugar, corn, rice, oleic acid, some paper products.

Buyers are taking a shorter view on forward commitments. The trend to not over 60 days is more pronounced.

To Seek Rail Rate Increase

ADDITIONAL 8 per cent increase in most freight rates will be asked of the Interstate Commerce Commission by the railroads. Smaller increases will be requested on coal, coke and iron ore.

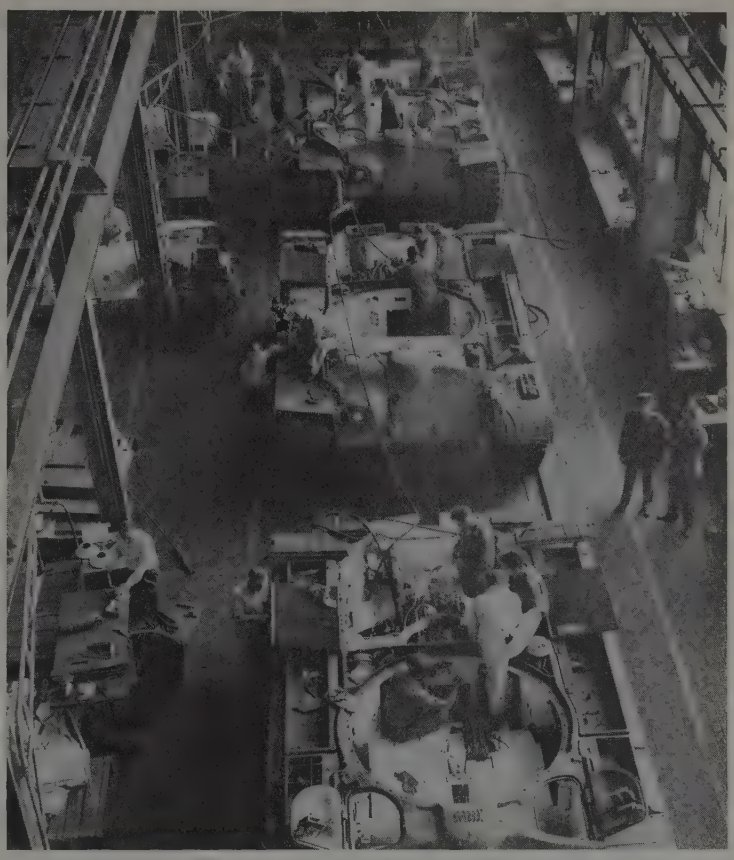
This was the decision reached recently at a conference of railroad executives in Chicago. It was said present rates are not producing enough revenue to meet the railroads' needs, and that the proposed increases do not take into consideration any further rise in costs which may result from current wage demands of 1,300,000 railroad workers.

Steel Men Join OIC Staff

FIVE more steel industry men have been appointed industrial specialists in the Office of Industry Co-operation, to serve under Melvin W. Cole, head of the Iron & Steel Division. Their main duties will be handling details of specific steel allocation programs.

They are: R. A. Marble and H. Van Zandt, retired from Carnegie-Illinois Steel Corp.; Tom E. Steele, formerly with McKeesport Tin Plate Co.; A. W. Mace, retired from Allegheny Ludlum Steel Corp., and E. S. Moorhead, formerly with National Tube Co. and before that with Republic Steel Corp. and other steel companies.

All but Mr. Mace were on the staff of the Steel Division, War Production Board, in World War II. Mr. Mace served as Washington manager for Allegheny Ludlum during the war.



REBUILDING TANKS: Hundreds of tanks are rolling in from all over the world to undergo a face-lifting at the Army's Detroit Arsenal. Rebuilt tanks are scheduled to come off the production line at a rate of 50 a month. Photo shows revamped tank hulls moving down the assembly line to be built up piece by piece. Hundreds of new parts will be added before the tanks are approved as ready for action. NEA photo

REPRINTS AVAILABLE

Reprints of the special report on steel prices, "A Guide to the Steel Industry's New Pricing System", published in the Sept. 27, 1948, issue of STEEL, pages 47-62, are available at 25 cents each up to 10 copies, and 10 cents each for all copies over the initial 10 ordered. Address inquiries to Readers' Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Procurement Offices Set Up

FIVE additional field procurement planning offices have been established by the Army Engineers to facilitate current planning for any emergency industrial mobilization.

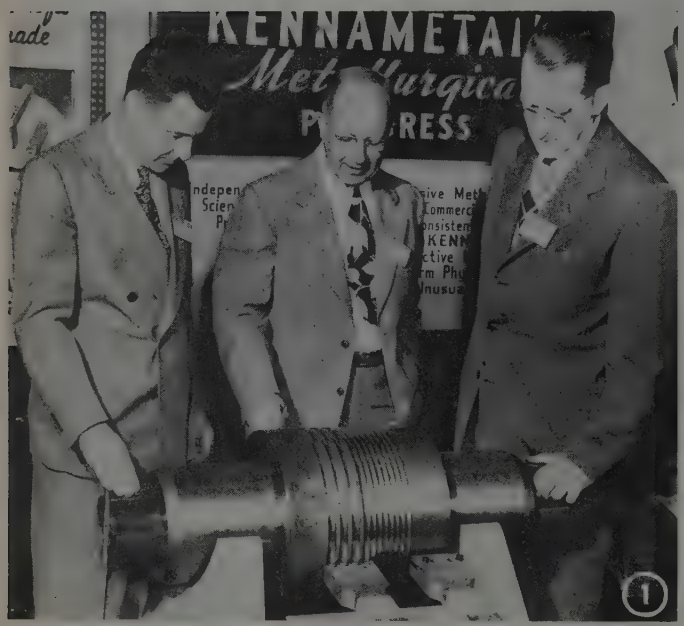
The new offices are at Cincinnati, Dallas, Detroit, Philadelphia and Seattle.

Argue Pittsburgh Plus Case

ARGUMENT in the historic Pittsburgh Plus action of the Federal Trade Commission against the United States Steel Corp. will be held Oct. 5 before the U. S. Court of Appeals in Philadelphia. The court will hear the pro and con on U. S. Steel's petition for dismissal of the FTC cease-and-desist order.

Equipment Builders Display Wares at Cleveland

More than 12,000 attracted to convention and exposition of Association of Iron & Steel Engineers, seeking ideas for improvement of industry's efficiency. Warned that progress in machine development is outrunning progress in human engineering



MORE than 12,000 persons, including many from foreign lands, trekked to Cleveland for the annual convention and biennial exposition of the Association of Iron & Steel Engineers at Public Auditorium, Cleveland, Sept. 28-Oct. 1.

The show featured nearly 300 exhibits, including newly developed equipment to help increase the output of urgently needed iron and steel products, to eliminate waste, to circumvent shortages and otherwise increase the efficiency of the iron and steel industry.

Attracting considerable attention was General Electric's x-ray thick-

Fig. 1—Engineers are here discussing advantages of Kennametal roll roughing and finishing tools. These cutters are useful on both hard and soft material and working cylinders after becoming dull can be rotated to a new cutting position

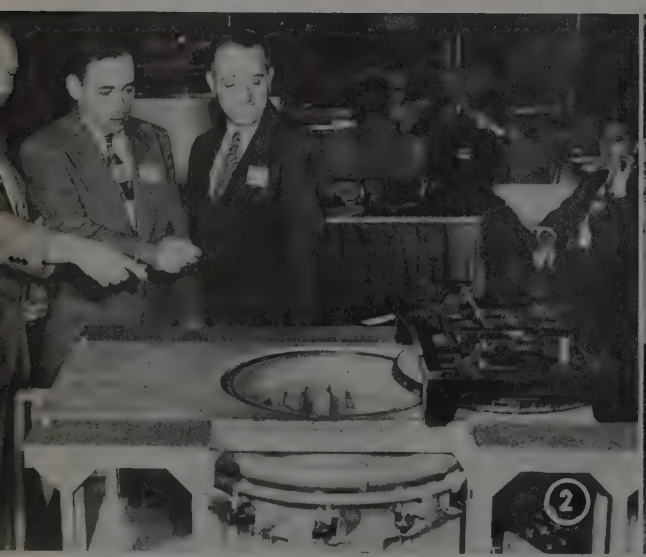


Fig. 2—Show interest centered around many excellent models of various steelmaking and treating units, one of which was the 20 ft circular soaking pit displayed at the Salem Engineering Co. exhibit

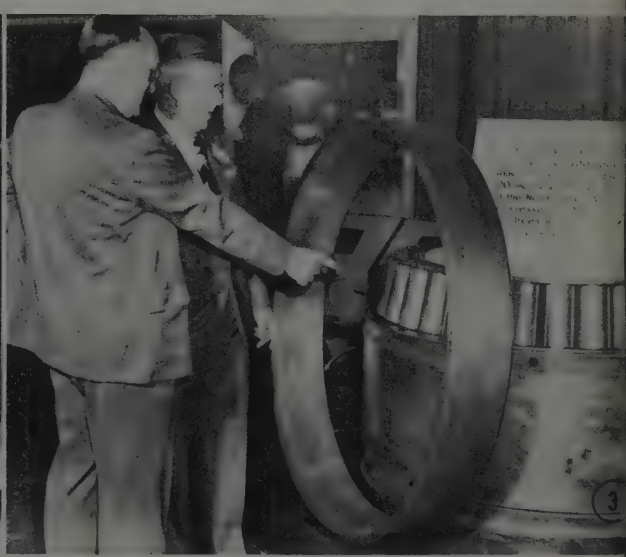


Fig. 3—This bearing, one of the first Timken balanced proportion units produced, was removed from back-up rolls on the 36 x 59 x 120 in. reversing hot mill of Alcoa. Bearing has been in operation since 1941

ness gage which measures the thickness of hot steel strip as it passes through the rolling mill at high speed. The gage was set up under operating conditions and at the conclusion of the show was to be installed at Carnegie-Illinois Iron Works.

Westinghouse Electric exhibited a similar thickness gage.

Helps Reclaim Scrap — On the conservation side was Linde Air Products' cutting blowpipe, which cuts through cinder, slag and other oxidation-resistant materials and helps in reclaiming ladle skulls and buttons to supplement acutely short scrap supplies.

Allis-Chalmers showed a liquid rheostat of 250 kw size, which was to be shipped to Copperweld Steel immediately following the show.

Floating Motor—Appearing to float on air, a motor for mill run-out tables, shown by Reliance Electric Co., Cleveland, is designed to ride with the roller regardless of any misalignment. Motor is supported by the drive end of the roller which makes a male fit into the shaft of the motor itself and is claimed to offer substantial maintenance economies.

Speed variations up to 16 to 1 are provided by a speed control unit developed by General Electric. It is particularly applicable to such operations as wire drawing and foil coiling.

Speedy communications between plant railroad dispatchers and train crews is provided by a high frequency railroad telephone displayed by Westinghouse.

Williams Named President— C. H. Williams, chief engineer, Carnegie-Illinois Steel Corp., was elected president for the calendar year 1949. He succeeds A. J. Fisher, assistant chief engineer of construction, Bethlehem Steel Co.

Other officers elected include: First vice president, A. S. Glossbrenner,

Fig. 6—X-ray thickness gage designed by General Electric Co. on display at the show will soon be installed on an 80-inch continuous hot strip mill. This unit will always give a reading within plus or minus 2 per cent of the gage indicator setting

Fig. 4—New development is this Oxweld C-60 cutting blowpipe capable of making continuous cuts through buttons and skulls 6 ft thick. Unit is indicated for sections having oxidation-resistant inclusions

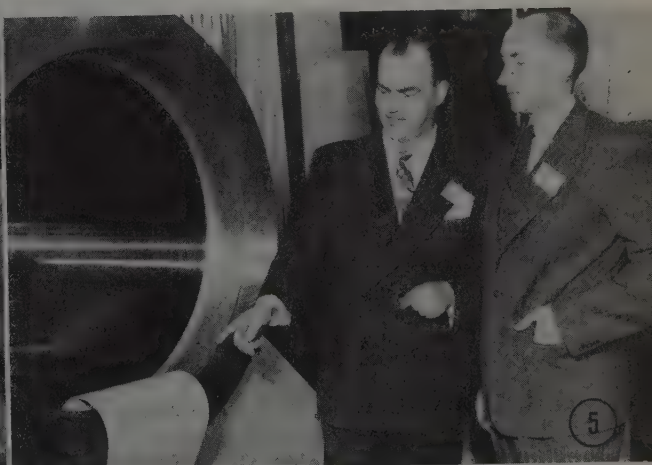


Fig. 5—Forged steel back-up roll sleeve No. 1000 produced by Heppenstall Co., Pittsburgh, is here being discussed by a company representative and AISE president A. J. Fisher

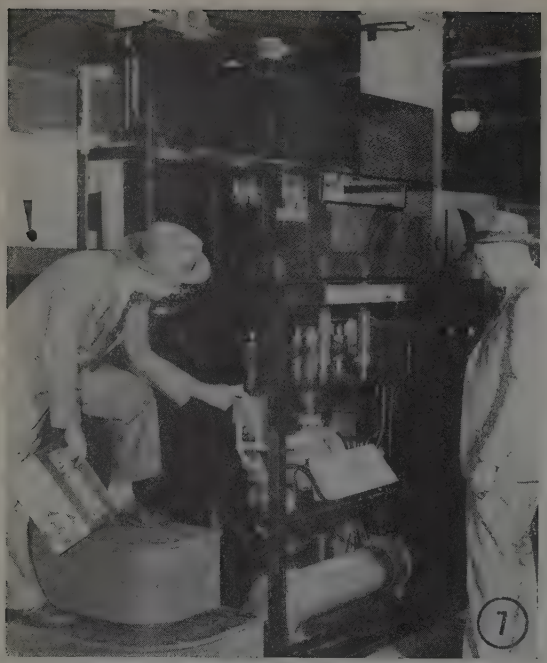


Fig. 7—Allis-Chalmers 250KW liquid rheostat, soon to be shipped to Copperweld Steel Co., was designed for use with a 1500 horse power, 2300 volt, 720 RPM wound rotor motor as a current control on a flywheel type steel mill drive

assistant vice president of operations, Youngstown District, Youngstown Sheet & Tube Co., Youngstown, O.; second vice president, J. F. Black, general superintendent, Wickwire-Spencer Steel Division, Colorado Fuel & Iron Corp., Buffalo; treasurer, I. N. Tull, electrical superintendent, Republic Steel Corp., Cleveland; and secretary, J. L. Young, vice president of engineering, National Tube Co., Pittsburgh.

Many Technical Papers—More than 40 papers were presented at 13 technical sessions.

Award Winners—Winners in the 1947 Kelly Award competition for technical papers are as follows: First, A. J. Fisher, Bethlehem Steel Co. Bethlehem, Pa. for his paper on "Recent Improvements in Cover Annealing"; second, E. T. W. Bailey, Steel Co. of Canada, Ltd., Hamilton, Ont. for "Oxygen-Accelerated Combustion in Open-Hearth Furnaces"; and third, R. E. Beynon, Carnegie-Illinois Steel Corp., S. Chicago, Ill. for "Rod Mills and Rod Mill Roll Design."

Strike Losses Heavy—John E. Goble, president, National Tube Co., who spoke on "The Challenge of the Machine Age" at the annual dinner of the association, pointed out that while our machines and the knowledge of them have improved tremendously their use has been impaired by human and group conflict.

Since the end of the war, he said, nonuse of machines due to disagreements have cost many billions of dollars in lost production.

Most important job facing us, Mr. Goble warned, is the development of human relations so that the working arrangements between human beings will keep pace with the physical developments of the machine age.

C. H. WILLIAMS
New President of AISE

1948 Plant Expenditures High

EXPENDITURES for new plant and equipment in last half of 1948 will total a record $9.6 billion, quarterly survey by the Securities & Exchange Commission and the Department of Commerce shows. This will push the year's total to $18.6 billion.

Although second half expenditures should set a record for dollar volume it reflects some increases in costs over the like period of 1947.

Fourth Quarter Plans—Planned expenditures for fourth quarter are estimated at about $4.7 billion, $250 million lower than actual expenditures in last quarter, 1947.

Above 1947 Total—Including outlays of $9.0 billion actually realized in the first half of the year, the $18.6 billion now estimated for total plant and equipment expenditures during 1948 is $2.4 billion more than the 1947 total.

The $18.6 billion to be spent in 1948 would be comprised of the following: Manufacturing $8,030,000,000; mining, $770 million; railroad, $1,320,000,000; other transportation, $680,000,000; electric and gas utilities, $2,540,000,000; and commercial and miscellaneous $5,280,000,000.

Colombian Steel Plant Planned

KOPPERS CO. INC. is making a preliminary survey relative to later establishment of a steel industry in Colombia. The survey is being made for the Colombian government. A complete report on the study is expected to be finished early next year and involves the construction of a completely integrated steel mill. A corporation has been formed by the government at Bogota, known as the Empresa Siderurgica Paz del Rio, with capitalization of $58 million. This figure is approximate cost of the steel plant.

The government will provide 51 per cent of the capital; private investors may subscribe 20 per cent. The Institute of Industrial Development will provide the balance. It will raise its funds through issuance of 6 per cent bonds backed by the state. The Development Institute has been pushing the project since 1940 and contemplates construction of a 500-ton blast furnace and output of finished steel items, such as nails, wire and small farm implements. The iron ore is said to be good and the coal acceptable.

Koppers Co. has had six representatives in Colombia for three months.

Venture Capital Drought

PRESENT taxation policies are depriving industry of necessary venture capital for expansion, Gwilym A. Price, Westinghouse Electric Corp. president, told the American Bankers Association in Detroit last week.

Of $26.5 billion needed by industry in 1947 to meet expansion, modernization and larger inventories, only $1.25 billion came from venture capital; the remainder from accumulated profits, bank loans, bonds and other forms of indebtedness.

Earnings Held Down

Reports of 45 metalworking firms show higher costs cut return in second quarter

CONTINUED high production and inflation raised the metalworking industry's dollar volume of sales and aggregate net earnings in second quarter above those of the first. However, inflation and its upward push on operating costs restricted corporate earning ability.

A tabulation by STEEL of 45 representative metalworking companies shows their total sales in second quarter, 1948, were $785,618,670, compared with $745,960,548 in first quarter. Likewise, aggregate net earnings climbed to $50,102,649 in second quarter from $48,362,593 in the preceding three months. However, the second-quarter net earnings represented 6.37c per dollar of sales compared with 6.48c in the preceding quarter. Comparisons may be visualized from the accompanying chart by STEEL.

In second quarter of 1947 those 45 companies had total sales of $672,378,830 and aggregate net earnings of $42,973,636, resulting in a net earnings rate of 6.39c per sales dollar.

Earnings Increased—With industrial production at a higher rate in the first half of 1948 than in the like period of 1947, as is borne out by the Federal Reserve Board's index, total sales and aggregate net earnings of the 45 metalworking companies rose substantially. Total sales in the first six months of 1948 were $1,531,579,218, compared with $1,288,476,272 in the first half of 1947, while aggregate net earnings in the first half of 1948 were $98,465,242, compared with $80,908,238 in the first half of 1947. Net earnings in the first half of 1948 were at the rate of 6.43c per sales dollar; in the first half of 1947 the rate was 6.28c.

Fifteen of the 45 companies reported lower sales in the second quarter of 1948 than in the first quarter of the year, 15 had smaller sales in the second quarter of 1948 than in the second quarter of 1947, and 15 had lower sales in the first half of 1948 than in the first half of 1947.

Twenty companies had smaller net earnings in the second quarter of 1948 than in the first quarter, 13 earned less in the second quarter of 1948 than in the second quarter of 1947, and 18 earned less in the first half of 1948 than in the like period of 1947.

In presenting their earnings statements, company executives continued to emphasize the problems of financing substantial outlays for modernizing and expanding.

Inland Appeals Court Ruling

INLAND Steel Co., Chicago, plans to appeal a decision handed down Sept. 23 by the U. S. Circuit Court of Appeals upholding validity of an NLRB order requiring the company to bargain with the United Steelworkers of America-CIO over provisions of the company's voluntary retirement program.

The case was taken before the Circuit Court of Appeals in April, 1948, following an NLRB ruling that company was obliged to bargain over changes in its retirement plan providing the union complied with the non-Communist affidavit provision of the Taft-Hartley Act. The United Steelworkers of America have not complied with ruling that they must file non-Communist affidavits, according to Inland.

The company believes that under the National Labor Relations Act it is not compelled to bargain over its 12 year old pension plan; that such bargaining is optional rather than compulsory.

K-F Lease Hearings Scheduled

LEASE of the government-owned Cleveland blast furnace plant to Kaiser-Fraser Corp. and the protests to the deal will be aired before Rep. George Bender's (Rep., O.) committee on expenditures at hearings to start Oct. 7.

Also to be investigated by the committee will be the extent and nature of iron and steelmaking facilities acquired from the government by Republic Steel Corp., wartime and postwar operator of the Cleveland blast furnace until its lease to K-F. The committee will attempt to determine Republic's ability to supply its merchant iron customers.

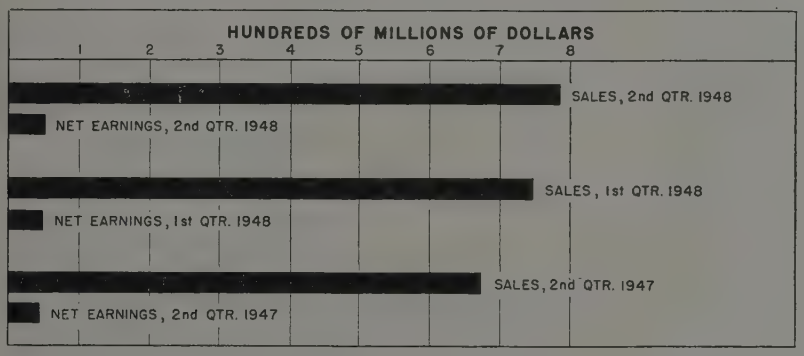
Meanwhile Wheland Co., Chattanooga foundry which is contesting the lease to K-F, and Henry J. Kaiser are bombarding the attorney general with statements, briefs and memorandums regarding legality of the lease.

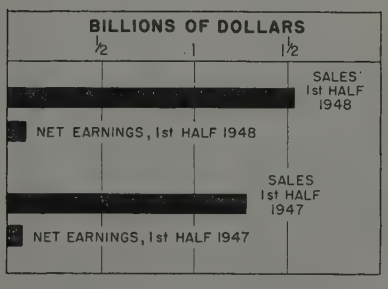
Asks Reducing Diet for Alcoa

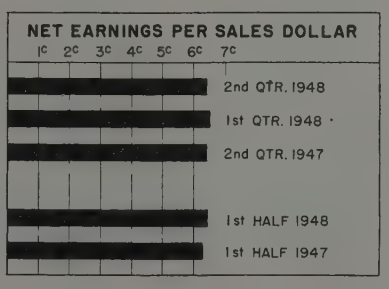
PROCEEDINGS to compel the Aluminum Co. of America to reduce its size have been started by the Department of Justice in the U. S. District Court in New York. The government is asking that Alcoa be forced to dispose of plants and properties to carry out a judgment of illegal monopoly entered against the company in 1945 but deferred until Alcoa's postwar position could be determined.

The petition does not ask for disposal of any specific properties but asks that a plan be submitted to the court by Alcoa or the court itself to determine what is necessary to "dissipate the effects of the alleged monopoly."

SALES AND NET EARNINGS
(45 Metalworking Companies)







Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Bureau of Mines developing marginal and submarginal mineral deposits. Exploitation of commercial deposits left to private industry. Munitions Board names steel committees

THIS YEAR the Mining Branch of the Bureau of Mines is spending a large share of its money on investigation and development of marginal and submarginal mineral deposits—that is, deposits whose exploitation is not economic today but will become so in the course of time. It is leaving to private mining interests the exploitation of deposits which can be worked commercially in these times of heavy demand.

The Mining Branch's program quite closely parallels the stockpiling program of the Munitions Board and is aimed particularly at finding new deposits of lead and zinc, copper, chromite, antimony, tungsten, mercury, graphite and mica.

Under specially earmarked appropriations it is carrying on the following work: Ascertaining the cheapest and best methods for drilling and blasting taconite iron ore; discovering, if possible, materials of construction in Alaska, like gypsum, limestone, cement materials, sand and gravel so as to reduce construction costs in that area; investigating use of phosphate rock of Idaho and Wyoming as a source of fertilizer and vanadium; development of methods for utilizing Montana chromite ores; and the location of new titanium deposits.

Steel Committees Named

ORGANIZATION of subcommittees of the Munitions Board's Iron & Steel Industry Advisory Committee has been completed as follows:

Alloy Steel Products Subcommittee: H. G. Batcheller, Allegheny Ludlum Steel Corp., Pittsburgh; L. E. Creighton, Rotary Electric Steel Co., Detroit; J. H. Parker, Carpenter Steel Co., Reading, Pa.; and C. M. White, Republic Steel Corp., Cleveland.

Alloying and Coating Materials Subcommittee: W. H. Colvin Jr., Crucible Steel Co. of America, New York; J. E. Lose, Carnegie-Illinois Steel Corp., Pittsburgh; F. B. Lounsberry, Allegheny Ludlum Steel Corp.; J. H. McElhinney, Wheeling Steel Corp., Wheeling, W. Va.; and E. M. Richards, Republic Steel Corp.

Carbon Steel Products Subcommittee: W. M. Akin, Laclede Steel Co., St. Louis; A. B. Homer, Jones & Laughlin Steel Corp., Pittsburgh; H. A. Roemer, Sharon Steel Corp., Sharon, Pa.; W. Sykes, Inland Steel Co., Chicago; J. T. Whiting, Alan Wood Steel Co., Conshohocken, Pa.

Forgings Subcommittee; V. F. Braun, Ladish Co., Cudahy, Wis.; W. E. Crocombe, American Brake Shoe Co., New York; W. J. Dean, Cape Ann Tool Co., Pigeon Cove, Mass.; W. A. DeRidder, General Metals Corp., Oakland, Calif.; R. A. Mitchell, Pittsburgh Forgings Co., Pittsburgh; A. J. Sanford, Cleveland Hardware & Forging Co., Cleveland; and H. F. Wood, Wyman-Gordon Co., Ingalls-Shepard Division, Worcester, Mass.

Iron Ore and Coal Subcommittee: G. W. Hewitt, Wheeling Steel Corp.; E. Hoyt II, Pickands Mather & Co., Cleveland; M. L. Jacobs, Bethlehem Steel Co.; H. Morrow, Sloss-Sheffield Steel & Iron Co., Birmingham; L. Willard, Interlake Iron Corp., Cleveland.

Scrap Subcommittee: L. B. Block, Inland Steel Co.; J. Claster, Luria Bros. & Co., Philadelphia; C. A. Ilgenfritz, United States Steel Corp of Delaware, Pittsburgh; H. H. Waldschmidt, Youngstown Sheet & Tube Co., Youngstown; R. W. Wolcott, Lukens Steel Co., Coatesville, Pa.

Present membership of the Iron and Steel Industry Advisory Committee is: H. G. Batcheller, Allegheny Ludlum Steel Corp.; G. W. Cannon, Campbell, Wyant & Cannon, Foundry Co., Muskegon, Mich.; J. Claster, Luria Bros. & Co. Inc.; B. F. Fairless, United States Steel Corp.; J. E. Galvin, Ohio Steel Foundry Co., Lima, O.; A. B. Homer, Bethlehem Steel Co.; C. R. Hook, Armco Steel Corp., Middletown, O.; W. R. Howell, Bliss & Laughlin Inc., Harvey, Ill.; E. Hoyt II, Pickands Mather & Co.; H. J. Kaiser, Henry J. Kaiser Co. Inc., Oakland, Calif.; R. A. Mitchell, Pittsburgh Forging Co.; B. Moreell, Jones & Laughlin Steel Corp.; H. Morrow, Sloss-Sheffield Steel & Iron Co.; H. Niedringhaus, Granite City Steel Co., Granite City, Ill.; Frank Purnell, Youngstown Sheet & Tube Co.; H. A. Roemer, Sharon Steel Corp.; F. E. Shumann, Lehigh Foundries Inc., Easton, Pa.; B. Somervell, Koppers Co. Inc., Pittsburgh; W. Sykes, Inland Steel Co.; W. S. Tower, American Iron & Steel Institute, New York.; E. T. Weir, National Steel Corp., Pittsburgh; C. M. White, Republic Steel Corp.; R. W. Wolcott, Lukens Steel Co.

Renegotiation Regulations

TWO important sets of procurement regulations of vital interest to government contractors now are expected to be ready for publication in final form before the end of 1948. Copies of the renegotiation regulations have been sent by Secretary Forrestal's Renegotiation Policy and Review Board to selected trade associations so that their members may criticize them and offer constructive suggestions.

After the board has digested the replies it will report to the Munitions Board which then will put the regulations before the secretaries of the three armed services for signatures. Then will come appointment of an overall Renegotiation Board and publication of the regulations.

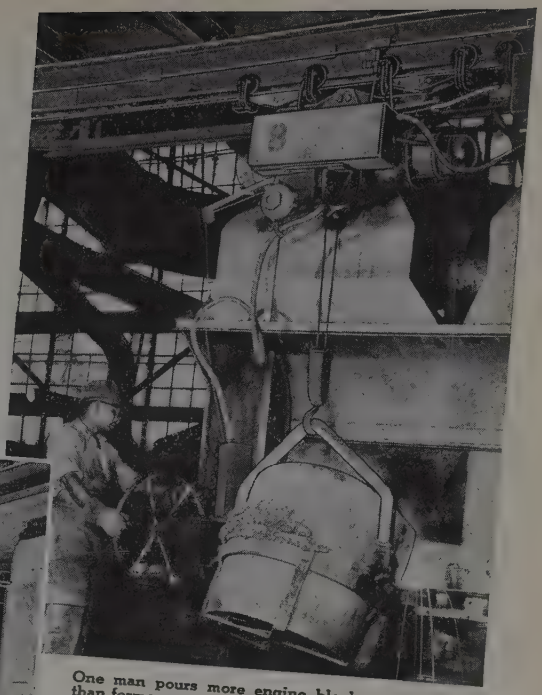
Regulations defining costs that are allowable or disallowable under cost-plus-a-fixed-fee contracts have been agreed to by Secretary Forrestal's Procurement Policy Council, and have been submitted to the Munitions Board for review and approval. Main changes from the World War II practice are inclusion of contributions, interest charges and general advertising as costs that may not be charged against the government. Advertising in trade and technical journals, as before, may be included as costs.

Venture Capital Scared

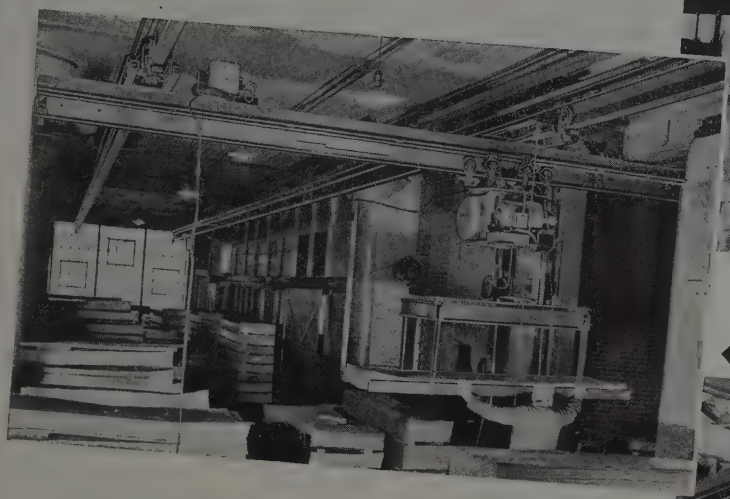
INVESTMENT of private United States capital in industrial enterprises in Latin America is not going as well as government officials had hoped. On the other hand, spokesmen for industry in Washington say many United States firms would like to put money in the Latin American countries but do not think it safe, basing their attitude not only on results of visits of their representatives in various countries to the south, but also on the fact that chapter IV of the Bogota Economic Agreement was carried by only a small margin, and then only subject to exceptions by a number of countries.

Chapter IV guarantees the integ-

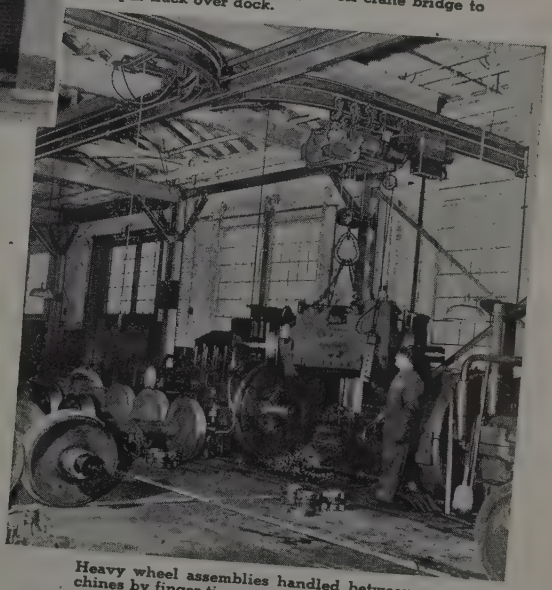
HEAVY LOADS GO "Up and Over" with finger tip control



One man pours more engine blocks per hour than former crew of three.



◀ Two ton loads of steel pass off crane bridge to spur track over dock.



Heavy wheel assemblies handled between machines by finger-tip control.

American MonoTractors do the hard jobs the easy way. They perform automatic "Up and Over"* handling operations with extreme accuracy and reliability. Finger-tip control assures accurate movement and spotting of the load. "Up and Over" machinery and equipment means no damage to machines or materials and no congestion in the operating area. More important, they eliminate back-breaking labor. The hazard of bad strains and hernia is gone.

In short, American MonoRail Overhead Handling Equipment increases production, saves labor, saves time and cuts costs. American MonoRail engineers will gladly show you that automatic handling pays and saves.

Free MOVIE

A twenty-minute 16 mm. sound film gladly loaned upon request.

THE AMERICAN MONORAIL COMPANY

13102 ATHENS AVENUE CLEVELAND 7, OHIO

rity of foreign investments and provides for fair compensation in event of expropriation of foreign-owned securities and property.

United States participants in the next economic conference, to be held in Buenos Aires in March of 1949 will make a drive to get this situation straightened out, to the end that United States investors may have definite assurances from each country that foreign capital will be treated fairly.

Petroleum Investment—Commerce Department statistics show that $408 million of United States private capital was invested in Latin America during 1947. But the great bulk of it was invested by the petroleum industry, and practically all in one country—Venezuela. There wasn't any notable United States promotion of general industry in the Latin countries.

In addition to what may be accomplished at Buenos Aires next year, government officials hope the Abbinck economic mission to Brazil may result in the setting up of an atmosphere in which more American companies will feel like spending dollars in that country. A good start in Brazil, it is felt, would have a big influence with the other Latin American countries.

Foreign Investments Stymied

CONDITIONS today offer little prospect for resumption of private investments abroad on any substantial scale, according to a study by the Brookings Institution, Washington. American capacity to lend and to export is large, and need for foreign capital in many countries is great, but even in countries relatively untouched by war the obstacles to private investment have tended to increase.

In some cases, the primary deterrent to successful lending is the impoverishment resulting from war. In other cases, long standing debt defaults and other barriers to foreign investment have been raised by the foreign governments concerned. In addition to ordinary business risks, foreign investments have been subjected to extraordinary political hazards such as the expropriation of foreign properties without adequate compensation, discriminatory labor laws, inequitable taxation, increasing government competition, and restrictions on the proportion of the capital of an enterprise which may be foreign-owned.

An important factor has been the fund-disbursing program of the United States government. It is hoped American financial aid will promote world recovery and encourage resumption of private investment operations. Nevertheless the immediate effect is to offer competition which private capital cannot meet.

SALVAGE ALUMINUM: Wrecked aircraft, salvaged engines, captured enemy stocks and other obsolete material of high aluminum content are being converted into stockpiles of aluminum ingots at a rate of 150 tons a month through an aluminum salvage program by the United States Air Forces in Europe. Photo shows German workers shoving a salvaged aircraft wing into a smelting furnace

British Research Promoted

TO CORRAL more American dollars, the British have created a government concern, the National Research Development Corp., to find practical uses for basic scientific findings resulting from research in the United Kingdom. It is to patent these discoveries, see that they benefit British industry, obtain patents abroad, and fix and collect royalties. It has five million pounds sterling to spend over the first five years.

The pattern to be followed will be much like that of another government-owned concern, Power Jets Ltd., created last year to commercialize British research in jet propulsion. This is proving a headache to the U. S. Air Force's Foreign Liaison Branch, which exchanges technical military information with the British air force. Current estimates are United States manufacturers of jet propulsion are paying royalties in the neighborhood of $1 million a year to Power Jets Ltd., and, in view of our current air force expansion, this figure is almost certain to soar.

The present situation took root in the early days of penicillin. The British say they discovered penicillin but Americans developed and patented it.

Seek To Cut Trade Barriers

AT A SECOND conference just held at Geneva, Switzerland, these countries signified their intention of becoming parties to the General Agreement on Tariffs and Trade: Denmark, Dominican Republic, El Salvador, Finland, Greece, Haiti, Italy, Nicaragua, Peru, Sweden and Uruguay.

That increases from 23 to 34 the number of participants in this new international trade organization which is committed to reduce or eliminate barriers to trade between the participating nations.

The original 23 member nations will conduct tariff and trade negotiations with the new members at conferences to start in Geneva on Apr. 11, 1949. Negotiations by the United States will be conducted under the Reciprocal Trade Agreements Act as amended by the 80th Congress.

One of the important moves at Geneva was agreement by a substantial number of countries to extend most-favored-nation treatment to western Germany to further the purposes of the Marshall Plan.

Steel Nationalization?

Britain's privately owned steel industry booms, but nationalization still threatens

ALTHOUGH British steel production continues at record high levels, the question of nationalizing the industry is bobbing up frequently. The Trades Union Council, powerful supporter of the Labor party, recently discussed the subject, but a split was revealed on the issue when the group turned down by an overwhelming majority a resolution pressing for nationalization as an emergency measure.

On the other hand, the Minister of Supply has come out with a flat announcement that the government is drawing up plans for nationalization and that the date has already been fixed when public ownership will take effect.

Steel Output Up — British Iron & Steel Federation, which opposes nationalization, points out that output per head in steel melting and rolling is now nearly 30 per cent above the prewar level. This increase is in marked contrast with the general showing of British industry, some of which is nationalized, which has had practically no production increase in the postwar era, compared with the prewar period. The federation also indicates that the price of steel is only 69 per cent over prewar despite a 107 per cent increase in wages and an 80 per cent boost in raw materials.

Although production in August was affected by holidays during the first part of the month, output was at an annual rate of 14,117,000 tons, the highest rate ever recorded for August. This compared with 12,084,000 tons in July and 12,179,000 in August, 1947. The target set by the government is 14,650,000 tons, and during the latter part of the month this was exceeded. Pig iron production in August was at an annual rate of 9,048,000 tons compared with a rate of 8,908,000 tons in July and 7,657,000 in August last year. A favorable fuel outlook holds promise for high output in September. Prospects for long-range production boosts were brightened with the recent announcement that the government will start work immediately on a $44 million steel expansion program in Scotland.

Ore Imports Rise—Favoring the current higher output rate have been increased imports of foreign ore and scrap. In July Britain imported 927,000 tons of ore, bringing the total for the first seven months of the year to 5,197,000 tons, which exceeds by more than 2 million tons the amount imported during the corresponding period of 1947. Scrap imports have also climbed, chiefly from Germany which will probably send even larger shipments during the last quarter. At the same time, the domestic scrap drive has produced satisfactory results.

Imports of semifinished steel are also mounting from Belgium and Luxemburg, relieving the pinch on Britain's re-rolling industry. Home industries, however, continue to press for supplies, and quotas are still necessary. The shipbuilding industry currently is complaining the most loudly about its supplies, followed by the foundries which are particularly short of high phosphorus pig iron.

Ruhr Steelmen Hit Prices

GERMAN steelmen, still protesting the Economic Council's refusal to grant a price increase of 19 marks per ton, hope to persuade the committee of American industrialists, which comes to the Ruhr soon to re-appraise western Germany's industrial plants for possible use in the European recovery program, that a price rise is essential to boost steel production.

The committee, headed by George M. Humphrey, president of M. A. Hanna Co., Cleveland, also has as its members Gwilym A. Price, president, Westinghouse Electric Corp., Pittsburgh, and Frederick V. Geier, president, Cincinnati Milling Machine Co., Cincinnati.

GEORGE M. HUMPHREY

Re-appraisal of Western Germany's industrial plants for possible use in the European recovery program will be made by a group of American industrialists, headed by Mr. Humphrey, president, M. A. Hanna Co., Cleveland

In addition to prices, the Germans hope to persuade this group of the uneconomic position of the separated steel companies, another factor also involved in the complicated pricing question. The Economic Council refused the price increase partly on the ground that such a boost would disturb the delicate cost-price-subsidy balance which has been achieved with such difficulty. Ruhr industrialists counter this claim with the argument that the free enterprise system is being introduced in other segments of the German economy, although the steel pricing action puts this industry under the thumb of government control more than ever.

Comparative Steel Prices — Comparative domestic steel prices per metric ton in western Europe are: Foundry iron—Ruhr $43.50, Belgium $61.50, England $41.70, France $46.20; steel bars—Ruhr $63.90, Belgium $69.60, England $73.50, France $67.80. The British and French domestic prices are currently subsidized. German prices are subsidized indirectly through reimbursements to producers on raw material costs.

Coupled with the pricing situation has come the military government announcement that it hopes to step up raw steel production to 8.5 million tons for the year beginning next July instead of the 7.2 million tons originally planned. Favorable developments from the currency reform and prospects for increased coal allotments prompt these higher expectations, which again have been greeted by protests from German steelman who say that such output would be impossible under present prices and with the low-producing separated steel firms.

Dismantlings Slowed Down — Dismantlings in the Ruhr have slowed down somewhat, and there is even some rebuilding. The wire works, for example, at Gelsenkirchen, totally destroyed during the war, have been rebuilt and have almost reached their former capacity on about half the acreage used before. Foreign inquiries, especially from South America, are heavy for all sorts of steel products. Such inquiries may have a more satisfactory response next year.

Western Germany has recently concluded an agreement to import 800,000 tons of Lorraine and North African ores in 1949, in exchange for Ruhr iron castings and rolled steels.

Denmark

IMPORTS of iron and steel into Denmark during the first half of 1948 to-

taled 149,755 tons, compared with 198,931 tons in the first half of 1947, a reduction of 24.7 per cent. Most of these imports came from Belgium and Luxemburg, Great Britain and the United States.

Austria

OUTPUT of steel ingots and castings during the first half of the year was 293,000 tons, compared with 133,000 tons in the first six months of 1947. For pig iron, the figures were 279,000 tons and 61,000 tons respectively. Although these figures show considerable improvement, current production is still inadequate to meet domestic requirements. Output increase is hampered by the scrap shortage.

Soviet Russia

SOVIET News Agency reports that a blast furnace was blown in at the end of June at the Stalin steelworks in the Donetz basin. An entirely automatic blast furnace has also begun operations at the Zaporoghye steelworks, according to reports. A number of coke oven batteries is said to have been started at Smolyaninovka, Kharkov, Chelyabinsk and Yenakievo.

Steel Exports Continue Fall

July ferrous exports, at 320,000 tons, continue downward trend started earlier in year

CONTRADICTING earlier predictions that the European Recovery Program would boost iron and steel exports to dangerous heights, figures showing July ferrous exports at 320,190 net tons indicate that the steady downward trend which began the first of the year is continuing.

June exports were 341,730 tons; May had overseas shipments totaling 346,453 tons. In the first three months of this year steel exports averaged 459,144 tons per month, compared to average shipments of 549,274 tons each month in 1947.

Spectacular declines in July occurred in exports of steel bars other than cold finished and alloy, black steel sheets, structural shapes, rails, seamless casing and oil line pipe. July exports, however, showed marked gains in ingots, blooms, billets, slabs, sheet bars, concrete reinforcement bars, plates other than boiler and fabricated, tin plate and tagger's tin. Tin plate and tagger's tin continues to be the heaviest United States export, followed by structural shapes, a relationship begun earlier this year. Last year structural shapes were the heaviest export, followed by tin plate.

U.S. FERROUS EXPORTS FOR JULY AND YEAR TO DATE

(Net Tons)

	June 1948	July 1948	Seven Months Total 1948
Semi-Finished and Finished Products:			
Ingots, blooms, billets, slabs, sheet bars	14,188	18,090	155,615
Wire rods	2,260	2,603	26,106
Skelp	5,728	2,020	31,849
Iron bars	384	138	3,035
Concrete reinforcement bars	9,919	13,498	84,023
Steel bars, cold finished	3,190	3,484	28,390
Other steel bars (excluding alloy)	21,262	17,607	195,804
Alloy steel bars	4,821	2,134	40,479
Welding rods, electric	1,159	1,187	10,030
Boiler plate	2,159	1,201	21,501
Other plates, not fab	22,684	26,736	210,419
Plates, fab., punched or shaped	4,283	2,040	16,343
Iron sheets, black	1,558	1,193	10,916
Steel sheets, black	31,678	27,821	253,752
Galvanized sheets	6,280	6,431	36,175
Strip steel, cold rolled	4,051	3,523	33,225
Strip steel, hot rolled	4,144	4,299	43,348
Tin plate and tagger's tin	41,323	50,907	374,175
Terne plate (incl. long ternes)	936	616	5,784
Structural shapes, plain	27,897	21,243	187,062
Structural shapes, fab	18,050	14,011	110,290
Frame and sashes	241	144	1,749
Sheet piling	1,979	1,710	24,750
Rails, 60 lb per yard and over	21,111	13,840	171,049
Rails, less than 60 lb per yard	1,745	384	6,038
Rails, relaying	7,128	3,267	21,521
Splice bars and tie plates	1,990	1,578	36,124
Frogs and switches	222	233	3,679
Railroad spikes	610	375	6,145
Railroad bolts, nuts, and washers	806	1,030	5,782
Car wheels, tires and axles	4,581	4,117	25,049
Seamless black pipe	1,378	2,041	12,175
Seamless casing and oil line pipe	24,123	18,206	138,670
Seamless boiler tubes	3,488	2,957	23,758
Welded black pipe	4,944	4,901	37,367
Welded galvanized pipe	3,457	2,759	24,820
Welded casing and oil line pipe	3,127	8,386	98,538
Welded boiler tubes	195	195	1,142
Other pipe and fittings	3,710	6,058	41,162
Plain wire	5,338	5,355	44,541
Galvanized wire	4,344	2,738	29,676
Barbed wire	2,287	3,329	24,997
Woven wire fencing	424	964	6,535
Woven wire screen cloth	526	453	3,322
Wire rope and strand	1,049	956	7,739
Wire nails	1,671	1,763	11,809
Other wire and manufactures	4,691	2,929	27,474
Horseshoe nails	13	4	358
Tacks	295	270	2,343
Other nails, incl. staples	1,261	715	7,080
Bolts, nuts, rivets and washers, except railroad	5,159	5,167	36,737
Forgings	1,872	2,487	16,790
Horseshoes	11	97	358
TOTAL	341,730	320,190	2,777,598

Source: United States Department of Commerce.

Forgery-proof Export Licenses

ADOPTION of a new type of export license which reduces the possibility of counterfeiting has been announced by the Department of Commerce through its Office of International Trade.

The new license incorporates forgery-proof paper and special validating machines as protective features. It will be filled out in its entirety within OIT, in a distinctive type face. The use of the safety paper license, known as form IT-628, will, for the time being, be restricted to authorizations of items on the positive list —commodities which require an export license for shipment to any destination. The familiar form IT-419 license will continue until further notice to be used when authorization is granted for shipment of non-positive list commodities to destinations in country group R. All license applications, however, will continue to be made on Form IT-419 in duplicate, and must be accompanied by the standard acknowledgement card, form IT-416.

OIT's announcement of the new license form coincides with the establishment of a new procedure in the handling of export licenses. Beginning immediately, all export licenses, including all outstanding licenses must be filed with the collector of customs or postmaster when first presented for clearance of any shipments.

May Get Brazilian Steel

FINISHED steel products produced at at the Volta Redonda plant in Brazil may soon be offered in the United States. At least conversations are being conducted by expectant American importers with the National Steel Co. of Brazil, owned in part by the Brazilian government, which owns and operates the works. The plant produces pig iron, and these rolled products: Structural shapes, rail, bars, plates, and hot and cold rolled strip steel. Up to the present, surplus steel production beyond the ability of Brazilian fabricating plants to consume has been going to other South American countries, mainly Argentina.

Controls Opposed

Conference Board speaker holds price regulation and allocation only prolong inflation

ELIMINATION of price controls and allocation, except perhaps on a few scarce commodities required for national defense, would be an important step in checking present inflationary tendencies, H. W. Prentis Jr., president, Armstrong Cork Co., Lancaster, Pa., said in New York recently at the 298th regular meeting of the National Industrial Conference Board, Waldorf-Astoria Hotel.

"Controls of this nature," he said, "will only prolong the agony, lead to less production and ultimately to regimentation of the nation's economic life."

He referred also to the desirability of raising reserve requirements and re-discount rates and installment credit controls and emphasized need for elimination of all make-work rules and feather-bedding practices by labor organizations.

Revamp Tax Policy—He believed, too, that the tax policy should be revamped in order to create more venture capital and to restore incentives to the middle class, which he regarded as the backbone of the country and as the really forgotten group over recent years. Mr. Prentis believed that serious consideration should be given to securing a larger portion of federal revenue from excise taxes rather than from income levies.

Mr. Prentis spoke as one of three members of a panel called upon to discuss inflation at the dinner session of the meeting. The other two were Walter E. Spahr, executive vice president, Economists' National Committee on Monetary Policy, Washington, and Marriner S. Eccles, member, Board of Governors, Federal Reserve System, Washington.

Offers Suggestions — Dr. Spahr made several suggestions, including restoration of redeemability of currency, reconstruction of the fiscal affairs of the federal government, radical reduction of governmental expenses.

Also he proposed that attacks on symptoms should give way to a study of causal factors and the employment of programs that deal properly with causes, and he added that such procedures as price fixing and rationing in times of peace were improper and injurious.

The speaker believed that it was useless to expect private enterprise to do much in the corrective sense regarding great demand, relative scarcities and high prices. "Most of the factors causing high prices and responsible for our depreciated currency lie outside the private enterprise system," he said. "They lie chiefly with the government and the central banking authorities, and it is from them that the major correctives must come."

Discuss Steel Problems

FIRST two in a series of regional technical meetings were held at the William Penn Hotel, Pittsburgh, Sept. 23 and at the Hotel Cleveland, Cleveland, Sept. 29 by the American Iron & Steel Institute. Some 400 members of the institute, employees of company members and faculty members of engineering colleges attended.

The meetings made available a wide variety of timely technical problems which the technical committees of the institute are engaged in studying.

Eight addresses on current problems were presented at each of the one-day meetings. Presiding at the Pittsburgh gathering were J. L. Mauthe, vice president, Youngstown Sheet & Tube Co., at the morning session and J. E. Lose, vice president, Carnegie-Illinois Steel Corp., at the afternoon session. In Cleveland E. M. Richards, vice president, Republic Steel Corp., presided in the morning, and H. B. Jordan, vice president, American Steel & Wire Co. was in charge in the afternoon session.

Similar technical meetings will be held by the institute in other cities.

Seek Halt on Freight Damage

TENTATIVE plan for attacking the problem of high damage costs incurred in shipping porcelain enameled products was drawn up by the coordinating group of the packaging and shipping committee of the Porcelain Enamel Institute during the group's recent meeting in Cleveland.

According to Chairman Ralph F. Bisbee, Westinghouse Electric Corp., the plan, subject to approval by industry, calls for standardization on test equipment for shipping tests on packaged porcelain enameled products; standardization on procedure and specifications for conducting these tests; installation of approved test equipment or arrangements for periodic tests to be conducted by an approved laboratory; testing of the packaged product periodically on the standardized equipment according to approved specifications. While this plan is primarily for manufacturers, Mr. Bisbee said it was hoped that carriers would join in the program.

Calendar of Meetings . . .

Oct. 4-7, American Institute of Steel Construction Inc.: Twenty-sixth annual convention, Chateau Frontenac, Quebec, Canada. Institute headquarters are at 101 Park Ave., New York.

Oct. 4-7, Industrial Packaging Engineers Association and University of Illinois: First annual industrial packaging and materials handling short course, Sherman Hotel, Chicago. Association headquarters are at 20 W. Jackson Blvd., Chicago.

Oct. 5-7, Industrial Packaging Engineers Association: Show at Hotel Sherman, Chicago. Association headquarters are at 20 W. Jackson Blvd., Chicago.

Oct. 5-7, American Institute of Electrical Engineers: Middle eastern district meeting, Washington. Institute headquarters are at 33 W. 39th St., New York.

Oct. 5-9, Concrete Reinforcing Steel Institute: Twenty-fourth semi-annual meeting, Grove Park Inn, Asheville, N. C. Institute headquarters are at 38 S. Dearborn St., Chicago.

Oct. 6, American Iron & Steel Institute: Regional technical meeting, Hotel Stevens, Chicago.

Oct. 6-9, Society of Automotive Engineers: Aeronautic meeting and aircraft engineering display, Biltmore Hotel, Los Angeles. Society headquarters are at 29 W. 39th St., New York.

Oct. 7-8, Society for Advancement of Management: Fall training conference at Illinois Institute of Technology, Chicago. Society headquarters are at 20 N. Wacker Dr., Chicago.

Oct. 11-13, American Society of Tool Engineers: Semi-annual convention, Biltmore Hotel, Los Angeles. Society executive secretary is Harry E. Conrad, 1666 Penobscot Bldg., Detroit.

Oct. 11-13, National Lubricating Grease Institute: 16th annual convention, Edgewater Beach Hotel, Chicago. Institute headquarters are at 4638 Mill Creek Parkway, Kansas City, Mo.

Oct. 12-13, Packaging Machinery Manufacturers Institute: 16th annual meeting, Hotel Roosevelt, New York. Institute headquarters are at 342 Madison Ave., New York.

Oct. 12-16, Chicago Section of American Chemical Society: Fifth national chemical exposition, Chicago Coliseum, Chicago. Exposition manager is Marcus W. Hinson, 1513 S. Wabash Ave., Chicago.

Oct. 13-15, American Society of Civil Engineers: Fall meeting, Statler Hotel, Boston. Society headquarters are at 33 W. 39th St., New York.

Oct. 13-15, Porcelain Enamel Institute: Tenth annual forum, at University of Illinois, Urbana.

Oct. 14, American Iron & Steel Institute: Regional technical meeting, The Warwick, Philadelphia.

Oct. 14-15, Gray Iron Founders' Society: Twentieth annual meeting and convention, Haddon Hall, Atlantic City, N. J. Society headquarters are at National City Bank Bldg., Cleveland.

Oct. 14-16, Foundry Equipment Manufacturers' Association: Meeting, Hot Springs, Va.

Oct. 18-22, American Institute of Electrical Engineers: Midwest general meeting, Milwaukee. Institute headquarters are at 33 W. 39th St., New York.

Oct. 18-22, Wire Association: 1948 annual convention, William Penn Hotel, Pittsburgh. Association heaquarters are at 300 Main St., Stamford, Conn.

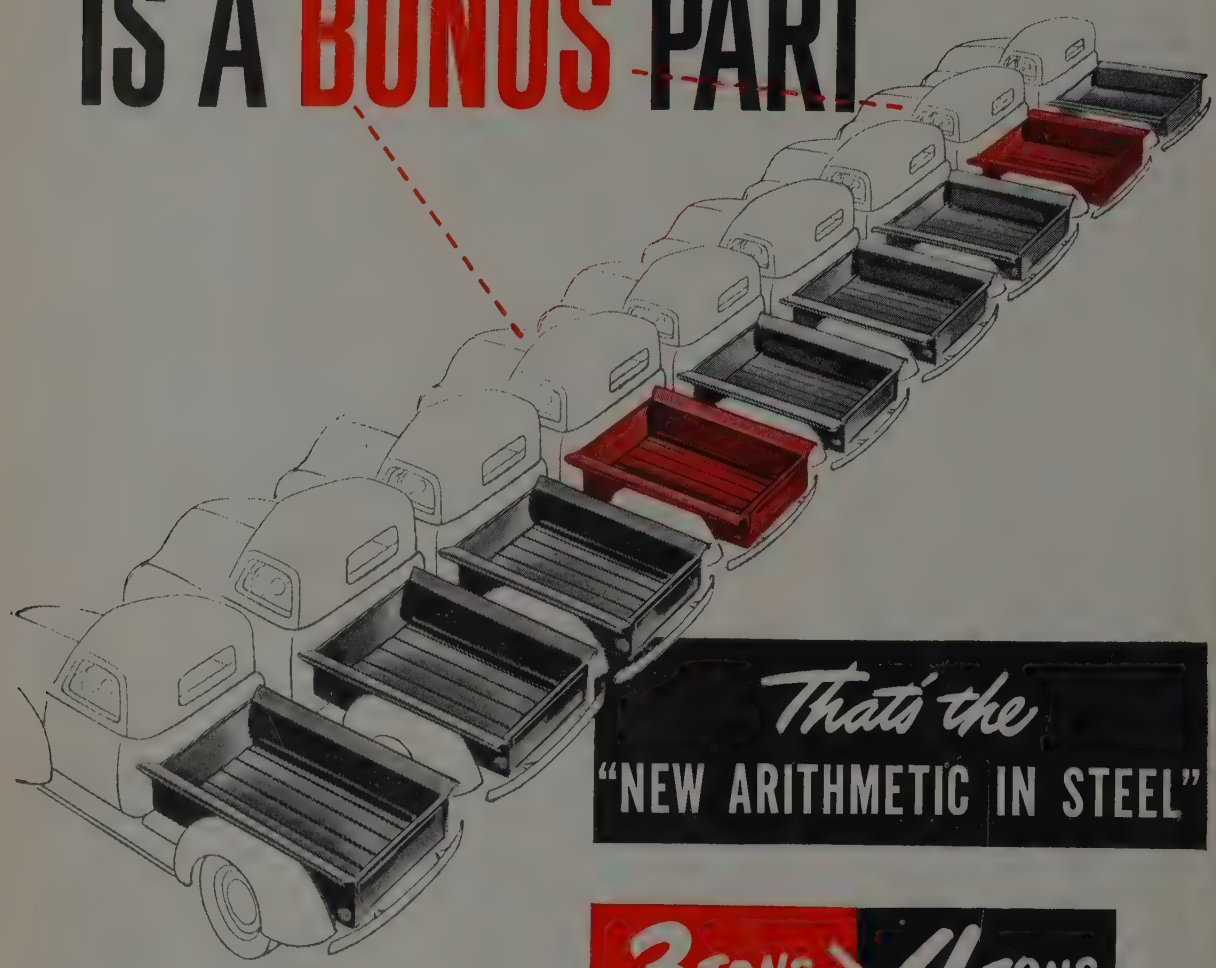
Oct. 18-22, National Safety Council: 36th national safety congress and exposition, at Hotels Stevens, Sherman, Morrison, Congress and LaSalle, Chicago. Council headquarters are at 20 N. Wacker Dr., Chicago.

Oct. 20-21, Illinois Institute of Technology: National conference on industrial hydraulics, Hotel Sheraton, Chicago.

Oct. 21, American Iron & Steel Institute: Regional technical meeting, The Copley Plaza, Boston.

Oct. 21-22, Society of Automotive Engineers: Production meeting and clinic, Statler Hotel, Cleveland.

EVERY FOURTH PART IS A BONUS PART



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By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

General Motors redesigning bodies for all models. New A series to be readied for Chevrolet, Pontiac and smaller Olds, new C bodies for big Olds and Buick

DETROIT

SIGNIFICANT changes are in the works for the entire line of passenger car bodies used by General Motors divisions for 1949 models, and their reception will be watched with keen interest by the rest of the industry. Before analyzing them, it may be well to review briefly the GM body setup as it has existed since a few years before the war. Essentially there were three basic body series, designated for simplicity as A, B and C. Each series included several body types — two-door, four-door, coupe, convertible, etc., although each did not have exactly the same lineup of types. The "C" bodies were used on Cadillac, the largest of the three Buick and Oldsmobile lines, and in slightly modified form by the Cadillac Fleetwood. "B" series was used by the smaller Cadillacs, the intermediate Olds line, the two smaller Buick lines and the so-called "streamliner" Pontiacs. The smallest of the three series, the "A" body, was adapted to the smaller Olds line, the "Torpedo" Pontiacs and the Chevrolet line.

This neat interchangeability meant lower unit costs and even though body shells were identical on two different makes they could be made distinctive simply by individualistic treatment of hoods and front and rear fenders. Few persons outside the industry, for example, realized that identical bodies were used interchangeably on Chevrolet, Olds and Pontiac, or on Cadillac, Buick and Pontiac.

Cadillac, Olds Redesigned — With the introduction of 1948 Cadillac and Olds models the "C" body series was completely redesigned, involving heavy expenditures in new tools and dies. Originally Buick was expected to go along but for some reason did not and retained the old "C" body on its Roadmaster models. The new "C" body is built in two-door (with streamline back), four-door (with stepped or notched back) and convertible types for the present. It may be extended in 1949 when Buick and Olds will adopt the body. This will mean disappearance of the "B" body from the Olds and Buick models; and in fact the "B" body as such will be discontinued for good, according to current reports.

Shortly after the war, General Motors, through its Fisher Body division, had almost completely tooled a new "A" body series, primarily for Chevrolet. On the decision of the policy committee, apparently, the whole project was tossed out in 1946 and 2500 tons of new tools and dies sold for scrap. The only reason hinted for the move was that the designs were out of date. Possibly GM had managed to get a peek at what was coming up in the current Ford lines and figured it had better start all over again. At any rate a new "A" body series was scheduled and is now ready to go on the 1949 models. It will be used by Chevrolet, Pontiac and the smaller Olds lines, no doubt including several more body types than are presently or to be available in the "C" series.

So, the outlook for 1949 is "A" bodies for Chevrolet and Pontiac, "A" and "C" bodies for Olds, "C" bodies for Buick and "C" bodies plus Fleetwood modifications for Cadillac. It will mean elimination of the Buick 40 or Special line, leaving only the 50 or Super and 70 or Roadmaster, both of which probably will have Dynaflow drive options. Possibilty is seen that Buick also will drop its smaller 110-horsepower 8-cylinder engine in favor of the larger 150-horsepower unit for which the Dynaflow transmission was "tailored." Also the Oldsmobile intermediate or 70 series will be dropped, leaving only the 60 series and the 90 or Futuramic types, the latter carrying the new V-8 valve-in-head engine and the former the present Olds six engine.

Automobile Production

Passenger Cars and Trucks— U. S. and Canada

	1948	1947
January	422,336	366,205
February	399,471	393,663
March	519,154	443,588
April	462,323	445,137
May	359,996	404,191
June	454,401	421,466
July	489,736	399,456
August	476,594*	364,478
September	425,000*	444,501
October	.....	461,536
November	.....	417,493
December	.....	492,109
12 mos.	.....	5,055,284

* Preliminary.

Estimate for week ended:

	1948	1947
Sept. 11	78,677	106,095
Sept. 18	94,410	109,734
Sept. 25	97,424	106,894
Oct. 2	115,000	101,608

Estimates by Ward's Automotive Reports

Gripes Against Dealers Mount

"GET IT while the getting is good" seem to be the current watchwords of too many automobile dealers, and their almost universal anxiety to turn a quick dollar is both creating bad public relations and causing more than a little concern among sales executives of manufacturers. The latter for a long time have been receiving floods of letters from customers and would-be customers protesting against treatment they have received or have not received. Their gripes are pretty hot and fall into about eight classifications, as cataloged by Jack R. Davis, sales manager of Ford. They are:

1. Selling cars out of rotation (on order lists).
2. Demanding trade-ins.
3. Giving low allowances on trade-ins.
4. Demanding under - the - counter premiums.
5. Loading cars with unwanted accessories.
6. Asking high prices.
7. Refusing to take orders.
8. Treating customers discourteously in general.

The industry, of course, recognizes the prevalence of these malpractices, particularly in dealerships in large metropolitan centers. However, its only club over dealers is revocation of franchise and this can be done only after careful proof of repeated irregularities. A manufacturer cannot force all his dealers to deliver cars in proper order to waiting customers, he cannot enforce courtesy, he cannot dictate trade-in allowances. There is a suspicion, unproved nat-

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ITALY'S BEST: Highest priced car on display at the 31st International Automobile Show at Turin, Italy, is the Alfa Romeo, listed at about $7500. The sleek convertible boasts a twin carburetor. More than 7000 exhibits from the United States and Europe were shown. NEA photo

urally, of collusion between dealers and manufacturers on the matter of accessories, despite the fact a number of companies have stated flatly the buyer need accept only those accessories he wants. Nevertheless, the sly cracks persist about sets of matched luggage, glove compartments fitted with sun glasses and rear windows with wipers for "backing into thunderstorms."

Sees No Early Correction—As aptly expressed by Mr. Davis, "So long as a new car can be purchased and resold at a substantial profit by the buyer (and this situation will prevail just so long as there is a continuation of the present-day strong sellers' market), these abnormal or so-called irregular merchandising practices will continue, irrespective of all the good intentions and the vigilance of either the manufacturer or the dealers or both."

How soon. Well, again taking Davis' slant—and he is in a pretty good position to know—he foresees a "sizable business recession at some future date," although as far as the automobile business is concerned, he looks for another 18-24 months of a strong sellers' market for cars—at least those in the Ford price field.

When you get out on the firing line to see what goes among individual dealers, the story looks a little different. A reporter for the *Detroit News*, for example, about a week ago visited 17 local dealers, all different makes of cars, seeking to buy a 1948 model. In 13 cases he could have driven a new car off the floor, and in three cases would have had to wait no longer than a week or two with one big if—if he would accept about $600 less for his 1942 model used car than it would have brought on a direct sale to a used-car lot. In only one case was he told he would have to "get in line and wait."

In varying degree, the same situation probably holds true in Chicago, New York, Cleveland, St. Louis and other large cities. The temptation for that extra buck makes more dealers forget their waiting lists in favor of a fast on-the-spot transaction.

Complain, But Buy— Complaints over high prices are universal among buyers and yet they still come thronging to dealers with cash-on-the-line. One estimate indicates 70 per cent of new car sales are straight cash, with financing involved in only 30 per cent. This estimate unquestionably is high, since many buyers borrow money from sources other than finance companies to purchase cars, and their deals are considered straight cash. Even so, there appears to be ample ready funds for purchase of automobiles. The reason is plain in figures, again citing Ford's Davis, showing a 141 per cent increase in per capita disposable income since 1939, contrasted with an average 103 per cent increase in price of the three cars in the Ford field, and a 71 per cent increase in the cost of living.

New credit restrictions imposed by regulation W on financed sales were expected to have their principal effect on used car turnover and while many dealers in this area have been trimming their inventories sharply, the move is probably as much seasonal as in anticipation of any appreciable decline in sales. Prices, particularly those above the factory-list level, have slipped possibly 5-10 per cent, again a seasonal trend as winter approaches. Since most sales have always carried a down payment of at least one-third, the effects of more stringent credit are being discounted along automobile row.

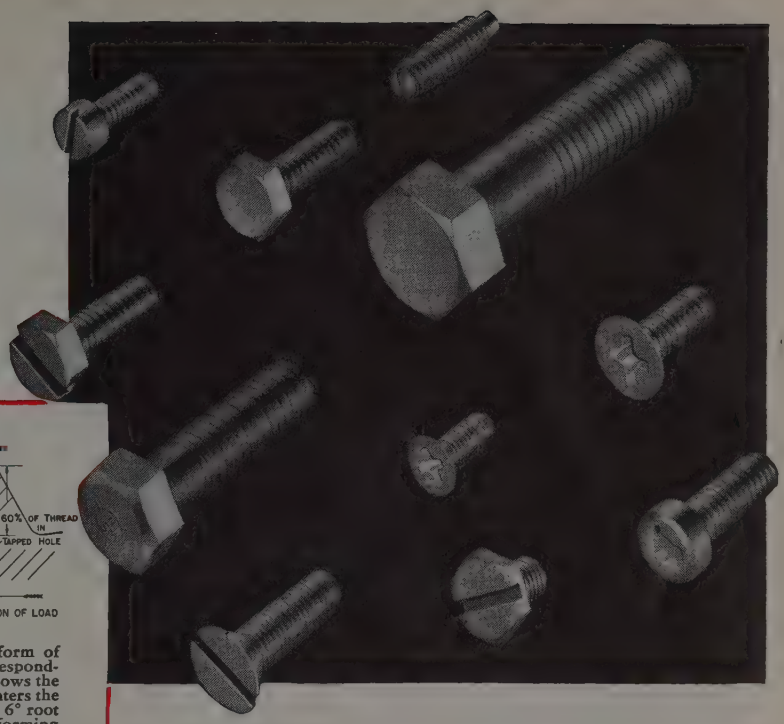
Dodge Expands

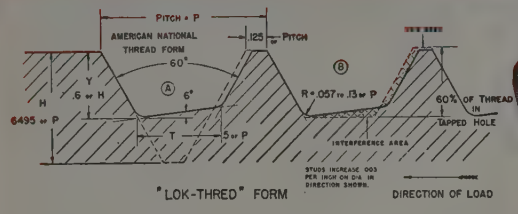
AN IMPOSING new industrial structure has been going up during the past few months north of the Dodge truck plant on Mound Road, covering an area of perhaps 1000 x 300 feet. No signs identify it and there have been no publicity handouts proclaiming its birth. Inquiry has developed the fact it is a Chrysler project and is called the "Dodge Nine-Mile Road Stamping Plant," scheduled for operation next year. The company has nothing to say on the score of what equipment will be installed, or what stamping job will be handled. Trade sources report the plant will handle principally the stampings required in bodies and cabs for Dodge trucks, with some work of this character being transferred from City Auto Stamping Co. in Toledo, O.

Considerable relocation of Chrysler Corp. stamping work is in prospect for 1949 models. In addition to the new Dodge Sheet Metal Plant, the Budd Co. in Philadelphia and Detroit will assume a major share of the pressed steel operations, feeding to Briggs Mfg. Co. plants in Detroit where bodies will be assembled and painted. Briggs, therefore, will handle less of the actual steel fabrication than formerly.

Although passenger car model changes are not expected before early next year some of the Chrysler Division plants already are making equipment changes necessary to handle new designs. Wider bodies, for example, call for changes in conveyors and paint baking ovens. A few pilot jobs in the 1949 line are being eased through shops to check equipment arrangement.

the only thread that OF ITSELF holds tight





The heavy black line at position A shows the form of "Lok-Thred", while the dotted line shows the corresponding American National Thread form. Position B shows the action which occurs when the male "Lok-Thred" enters the 60% American National Thread tapped hole. The 6° root angle, through the interference created, causes a reforming of the socket thread, which fills the void area and causes a locking action, plus a positive seal.

IN "LOK-THRED", NATIONAL SCREW OFFERS AN IMPORTANT NEW TYPE OF BOLTS AND SCREWS

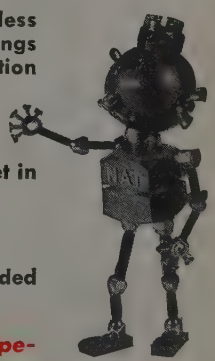
"Lok-Thred" fasteners actually become tighter in service, even under vibration. They are available now in bolts and screws as well as studs, and with special or standard heads.

They not only lock more securely than American National Threads (see diagram), but also seal positively, even against liquids under pressure. Bosses and blind tapping can be eliminated.

National PRODUCTS

Note These Important "Lok-Thred" Advantages

1. Lock securely and become tighter in service.
2. Have much higher fatigue limits than fasteners with conventional threads.
3. Stronger in both tension and torsion than ordinary American National Threads.
4. Carry entire normal working load on 6° angle at root of thread under high compressive prestress.
5. Modified American National Threads permit use of standard tools.
6. Re-usable and on any re-application less than one-half additional turn brings torque back to its original installation value.
7. Do not require selective fits.
8. Do not gall when being driven nor fret in service.
9. Act as dowels and taper pins.
10. Seal positively and eliminate added bosses and blind tapping.



Write for "Lok-Thred" booklet, or send specific information on your fastening problem.

THE NATIONAL SCREW & MFG. COMPANY, CLEVELAND 4, OHIO

Thew Expands Parts Unit

Moves to keep pace with increased emphasis on machinery maintenance to cut costs

THEW Shovel Co., Lorain, O., has completed an expansion program at its Elyria, O., Parts Division in a move to keep pace with the metalworking industry's increased emphasis on more efficient machinery maintenance as one means of combating high costs.

Begun early last winter, the expansion consists of additions to plants 3 and 5 in Elyria. Plant 5 is a manufacturing unit which currently produces all pins and bar steel products and bronze parts for both new production and service parts in Thew power cranes and shovels. The foundry at plant 5, in which all bronze bushings are made, was expanded by the addition of a 1 story structure, 40 x 80 ft. Installation of new foundry equipment will increase production.

New Warehouse — Expansion at plant 3 consists of a new warehouse, an office addition and the paving of 7000 sq yds of additional outside storage area. The whole program is designed to increase Thew parts deliveries which currently exceed 350,000 shipments annually, including 2000 air shipments.

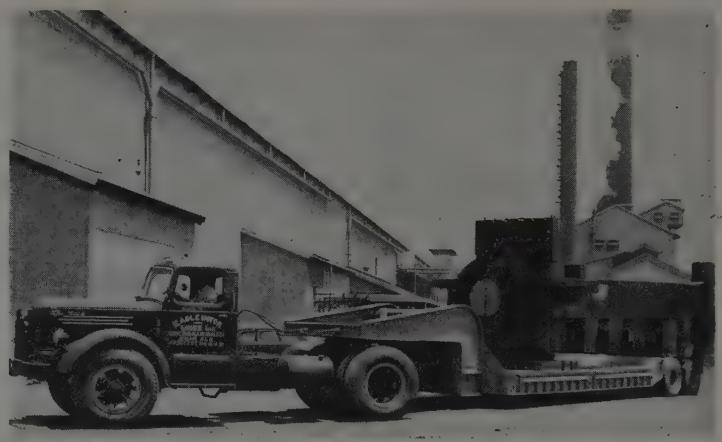
The Parts Division was formed in March, 1943, when Thew purchased the Old Radiant Mills stocking factory in Elyria to provide building facilities for the new department. The division is now operated as virtually an independent enterprise. A. W. Wagner is manager of parts sales; N. W. Anderson is superintendent of plant 3, and Cyril Brecknock is superintendent at plant 5.

Bethlehem Wins Safety Awards

FIRST, second, third and fourth places in the 1947-1948 safety contest between the major steel plants of the country, sponsored by the Metals Section of the National Safety Council, have been won by plants of Bethlehem Steel Co.

Already twice a first place winner, the company's Johnstown, Pa., plant made it three in a row by again taking top honors. The Bethlehem, Pa., plant was second. The plant at Lackawanna, N. Y., finished in third place, and the Sparrows Point, Md., plant in fourth.

Awarding of places in the contest is based on the ratio of lost-time accidents to man-hours worked over the 12-month period extending from July 1 to June 30 of the next year. Group A, in which the Bethlehem plants participated, comprises the nation's major steelmaking plants. The Johnstown unit took the first honors with less than one accident per million man-hours of work, improving its 1946-1947 record by 37 per cent. The four steel facilities together showed a combined reduction of 33 per cent in lost-time accidents, with a frequency rate of 30 per cent of that of the steel industry.



BIG MOVING JOB: Seven of these stands for lathe mill housings, weighing 107 tons each, presented a formidable job in transfer from rail siding to their steel mill locations in Birmingham, Ala. The moving was accomplished with a low-bed trailer and a Mack diesel tractor

Hotpoint Opens Chicago Unit

HOTPOINT Inc. has opened its new Chicago plant built for mass production of electric ranges. Completed in a 15-month period, the plant provides 1 million sq ft of manufacturing space and is designed for streamlined production flow. Seven miles of conveyors channel range sub-assemblies and parts to four main assembly lines. Beginning of production in this facility marks the completion of the Hotpoint expansion and modernization program which cost more than $20 million in new manufacturing units.

Plant is now turning out the firm's newest development in electric cooking, the pushbutton range. By Jan. 1, output of 4000 workers is scheduled to attain 12,000 ranges per week.

Atomic Power in 20 Years?

CONSTRUCTION of the first atomic pile to be used specifically for the production of electrical power will start next spring 18 miles north of Schenectady, N. Y., the Atomic Energy Commission has announced.

The experimental atomic power plant, which, it was said, may pave the way for widespread use of nuclear power in 10 or 20 years, will be built on a 4500-acre area of woodland and marginal farm land near East Galway, N. Y. General Electric Co. will be custodian of the reactor at its Knolls Atomic Power Laboratory in Schenectady, which it operates under contract with the commission. A GE representative made the prediction that the pile "might be operating in three years after we start construction."

Other atomic reactors in operation or planned at Chicago, Hanford, Wash., Brookhaven, N. Y., and Oak Ridge, Tenn., are for research or production of radioactive isotopes, and what power is turned out is merely a by-product.

Farm Tool Manufacturer Sold

EXPANSION of the Harvey line of farm implements, and also streamlining present production facilities of Harvey Mfg. Co. Inc., Racine, Wis., have been announced by the new owners, John W. Rourke, president and Harold R. Mandel, vice president.

The two men head a group which has purchased the interests of Carlton A. Soelberg and Winfield S. Mayne. Mr. Rourke is vice president and sales manager of Havana Metals, Havana, Ill., and Mr. Mandel is president of Maple City Stamping Co., Peoria, Ill.

The new owners of the firm, in addition to expanding the Harvey line, expect the Harvey forge shop, acquired as part of the transaction, to supplement output of their Peoria and Havana plants.

Briefs . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Foxboro Co., Foxboro, Mass., manufacturer of industrial instruments, control valves and similar equipment will move its Houston, Tex., branch to a new location at 2518 South Blvd. on Oct. 15.

—o—

Wickwire Spencer Steel Division, Colorado Fuel & Iron Corp., set a record for its Tonawanda, N. Y., plant in August by producing 18,778 tons of steel ingots. Improvements that have been made in the plant provide the possibility that this record will again be broken.

—o—

Youngstown Sheet & Tube Co., Youngstown, will hold open house at its three plants in the Youngstown district on Oct. 5. Special tours will be conducted for high school juniors and seniors during the day.

—o—

Cenco Corp., recently organized as a holding company has acquired Central Scientific Co., Chicago, manufacturer and distributor of scientific apparatus. Heading the new group is E. Perry Holder, chairman of the board of American Bosch Corp., Great American Industries and Arma Corp. Caryl W. Dempsey will remain as president of Central Scientific.

—o—

Cummins Engine Co. Inc., Columbus, Ind., has placed a new model HR-600 diesel engine in production. Based on the H-600 model, the new engine develops 165 horsepower, 10 per cent more than the original model. Field conversions can be made to change the original engine to the new model.

—o—

CKL Machinery Co., Oshkosh, Wis., is constructing a foundry addition to increase its capacity by 25 per cent. The building is expected to be finished in 60 days.

—o—

Moto-Truc Co., Cleveland, has opened an office in Chicago under the name Moto-Truc Sales Corp.

—o—

Illinois Institute of Technology, Chicago, announces its June graduates in engineering and science are drawing average starting salaries of $264.72 which is 53 cents less than the figure for February graduates. Figures are based on a 40-hour week.

—o—

Hamilton-Thomas Corp., Hamilton, O., has been formed to operate Economy Pumps Inc., Klipfel Mfg. Co. and Liberty Planers Inc. as manufacturing divisions. Richard Thomas is president of the new organization.

—o—

Instrument Development Laboratories Inc., Chicago, announces its name has been changed to Nuclear Instrument & Chemical Corp. The firm manufactures instruments for use in nuclear and radioactivity measurement.

—o—

General Motors Corp., Detroit, had 433,909 common and preferred stockholders for the third quarter of 1948.

—o—

Hydro-Line Mfg. Co., Rockford, Ill., has named Rogers & Baxter, St. Louis, as its representative for southern Illinois and Missouri, Iowa, Nebraska, Kansas and Oklahoma to handle its line of air and hydraulic cylinders and special machinery.

—o—

Buckeye Tools Corp., Dayton, O., manufacturer of portable air and electric tools, has appointed John Best & Associates, Toronto, Ont., as its distributor in Canada.

—o—

Metallizing Engineering Co. Inc., Long Island City, N. Y., is celebrating its 15th anniversary. Founded in 1933 as a sales agent for metal spraying equipment, the firm began manufacture of its own metallizing gun in 1938. R. A. Axline is founder and president.

—o—

National Cylinder Gas Co., manufacturer of industrial gases, oxy-acetylene welding apparatus, arc welding equipment and electrodes, has moved to its new executive headquarters at 840 N. Michigan Ave., Chicago, in a seven-story building recently purchased by the firm.

—o—

Acme Steel Co., Chicago, has moved its Portland, Oreg., office and warehouse to larger quarters at 2044 N. W. Pettygrove St.

—o—

Speco Inc., Cleveland, manufacturer of industrial paints, has purchased a building at 7308 Associate Ave., Cleveland, for increased production of Rustrem, an anti-rust paint.

—o—

Vascoloy-Ramet Corp., Chicago, manufacturer of tantalum-tungsten cutting tools and related products, has opened a warehouse and distributing office at 308 N. 26th St., Birmingham.

—o—

Hercules Powder Co., Wilmington, Del., reports that the ammonia units at the Louisiana, Mo., ordnance plant will be moved to the San Jacinto Ordnance Depot near Houston, Tex., where Hercules will set them up and operate them.

—o—

Gray Iron Founders' Society Inc. has moved to National City Bank Bldg., Cleveland.

—o—

Converto Co., producer of truck trailers and fabricator of structural steel and stainless steel for processing industries, has begun operations in a new fabricating plant in Pittsburgh.

—o—

Carborundum Co., Niagara Falls, N. Y., will expand its Refractories Division with additional production starting Jan. 1 in the recently acquired, former Chris-Craft Corp. plant near Falconer, N. Y.

—o—

H. M. Harper Co., manufacturer of fastenings, has moved to a new plant at Oakton St. and Lehigh Ave., Morton Grove, Ill., near Chicago.

—o—

American Society of Civil Engineers and **Associated General Contractors of America** have formed a National Joint Co-operative Committee to recommend procedures in fields where both organizations are mutually concerned.

—o—

Jay J. Seaver Engineers, Chicago, have been retained to build a pig machine for Tennessee Products & Chemical Corp., Nashville, Tenn., at the latter company's Rockwood plant.

—o—

Motch & Merryweather Machinery Co., Cleveland, has been named as United States representative for external honing equipment made by Delapena & Son Ltd., Cheltenham, England.

—o—

Tyson Bearing Corp., Massillon, O., has appointed C. J. Edwards Inc., Detroit, as its representative in the automotive manufacturing and industrial fields in Michigan and R. A. Rodriguez Inc., New York, as export representative for all foreign countries, except Canada.

—o—

L. G. S. Spring Clutch Corp., Indianapolis, division of Curtiss-Wright Corp. has named the following firms as sales representatives: Smith Power Transmission Co., Cleveland; Transmission Engineering Co. Inc., Philadelphia, and Potter & Dugan Inc., Buffalo.

The Business Trend

CONTINUING its recovery from the early September holiday dip, industrial activity is almost back to the postwar peak. In reflecting this movement, STEEL's industrial production index edged up one point in the week ended Sept. 25 and registered a preliminary 169 per cent of the 1936-1939 average, following a 10-point rise the preceding week. Thus, industrial output has returned to the high levels which prevailed during the summer months.

Steel ingot output remained at 96 per cent of capacity for the second consecutive week, giving a monthly average output in excess of 95 per cent. Despite this high level of production in the steel industry, demand for steel continues to exceed supply.

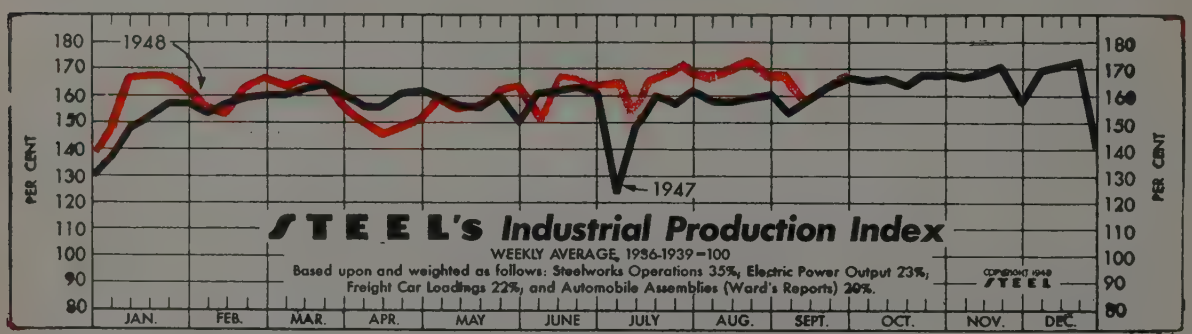
COAL—Bituminous coal production, at 11,890,000 net tons for the week ended Sept. 18, represented a gain of more than 1 million tons over the preceding week and almost returned to the 12-million-ton weekly level of the summer months. Production for the year is approximately 414,316,000 tons, 23 million tons less than for the corresponding period of 1947.

PRICES—Primary market prices rose 0.8 per cent during the week ended Sept. 18 and reached a new postwar peak of 169.4 per cent of the 1926 average, according to the Bureau of Labor Statistics. Raw materials were at 182 per cent and manufactured products were at 165.7 per cent for the same period. Metals and metal products were among the items that also attained postwar peaks during the week.

AUTOMOBILES—Gains in output for the automobile industry have also contributed appreciably to industry's return to high production in the last two weeks. Outturn of 97,424 units in the United States and Canada for the week ended Sept. 25 represented a gain of 3000 units over the preceding week. A further advance in output is expected now that the strike at the Detroit plant of a major body builder has been settled.

PETROLEUM—Crude oil stocks east of California totaled 200,363,000 bbl as of Sept. 18, according to the Bureau of Mines. This represents an increase of more than 1.5 million bbl over the preceding week. Stocks of crude petroleum in California were not reported for the period because of strikes; therefore, comparisons of U. S. totals with the preceding week cannot be made.

CONSTRUCTION—Building and construction awards in the 37 states east of the Rocky Mountains totaled $854,091,000 in August, showing a normal seasonal decline of 11 per cent from July but a 4 per cent gain over the corresponding month last year. Although the major reporting regions all showed cumulative gains during the first eight months of this year as compared with the corresponding period last year, there appeared for the first time in several months a perceptible tendency toward declines in New England, metropolitan New York and northern New Jersey, the southeastern states and southern Michigan. These areas all showed declines from the dollar volume reported for July and also for August, 1947.



STEEL's Industrial Production Index

WEEKLY AVERAGE, 1936-1939=100

Based upon and weighted as follows: Steelworks Operations 35%, Electric Power Output 23%, Freight Car Loadings 22%, and Automobile Assemblies (Ward's Reports) 20%.

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Index (chart above): Week ended Sept. 25 (preliminary) 169 Previous Week 168 Month Ago 169 Year Ago 166

BAROMETERS of BUSINESS

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	96.0	96.0	96.0	94.0
Electric Power Distributed (million kilowatt hours)	5,461	5,426	5,478	4,956
Bituminous Coal Production (daily av.—1000 tons)	1,982	1,796	2,052	2,039
Petroleum Production (daily av.—1000 bbl.)	5,343	5,294	5,529	5,196
Construction Volume (ENR—Unit $1,000,000)	$100.3	$183.3	$95.2	$135.2
Automobile and truck output (Ward's—number units)	97,424	94,410	100,699	106,894

* Dates on request. † 1948 weekly capacity is 1,802,476 net tons. 1947 weekly capacity was 1,749,928 net tons.

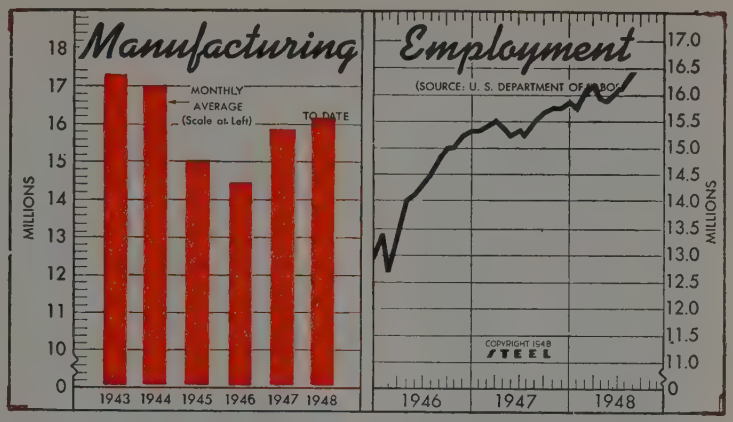
TRADE				
Freight Carloadings (unit—1000 cars)	914†	910	891	938
Business Failures (Dun & Bradstreet, number)	101	84	96	77
Money in Circulation (in millions of dollars)‡	$28,083	$28,156	$27,965	$28,556
Department Store Sales (changes from like wk. a yr. ago)‡	+11%	−2%	+12%	+7%

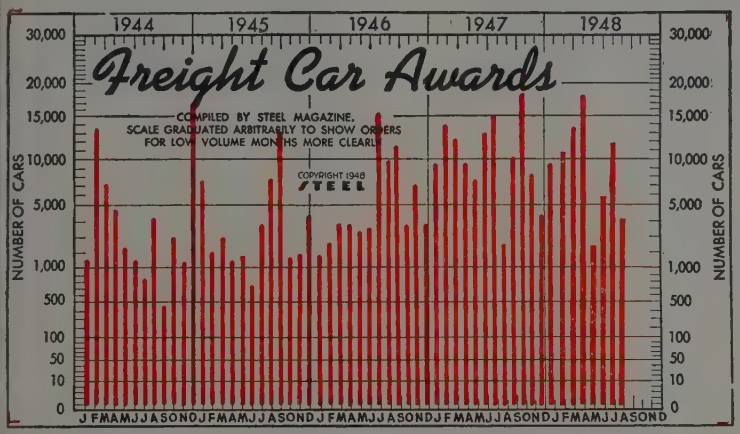
† Preliminary. ‡ Federal Reserve Board.

Factory Employment

(000 omitted)

	1948	1947	1946
January	16,267	15,372	13,499
February	16,183	15,475	12,751
March	16,269	15,510	13,433
April	15,950	15,429	14,054
May	15,904	15,569	14,159
June	16,113	15,672	14,371
July	16,155	15,580	14,526
August	16,456	15,962	14,876
September	.....	16,175	15,035
October	.....	16,209	15,064
November	.....	16,256	15,271
December	.....	16,354	15,348
Monthly Ave.	.....	15,794	14,365




Freight Car Awards
COMPILED BY STEEL MAGAZINE.
SCALE GRADUATED ARBITRARILY TO SHOW ORDERS FOR LOW VOLUME MONTHS MORE CLEARLY
COPYRIGHT 1948 STEEL
NUMBER OF CARS
1944 1945 1946 1947 1948
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D

Freight Car Awards

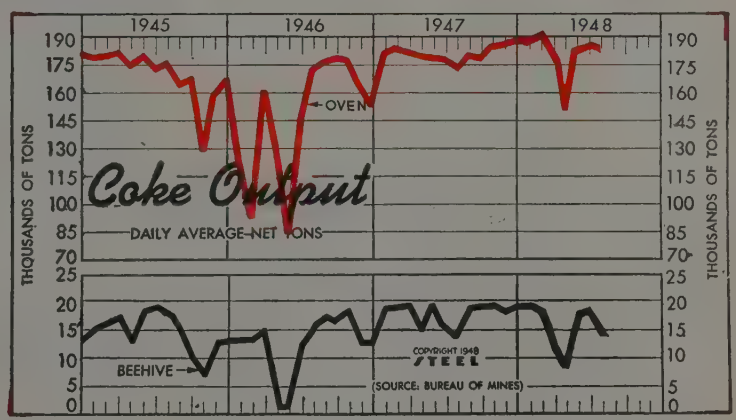
	*1948	*1947	*1946	1945	1944
Jan.	9,213	9,222	1,481	7,200	1,020
Feb.	10,698	13,724	2,328	1,750	13,240
Mar.	13,427	12,048	3,512	2,500	6,510
Apr.	17,227	9,186	3,564	1,120	4,519
May	2,230	7,389	2,900	1,526	1,952
June	5,868	12,784	3,335	670	1,150
July	11,923	14,840	14,836	3,500	795
Aug.	3,739	2,359	9,527	7,240	3,900
Sept.	....	9,917	11,102	12,840	400
Oct.	....	17,737	3,407	1,320	2,425
Nov.	....	8,079	6,690	1,650	1,065
Dec	....	4,030	3,441	4,116	16,245
Total	....	121,315	66,723	45,432	53,221

* American Railway Car Institute.

Coke Output

Bureau of Mines
(Daily Average Net Tons)

	Oven		Beehive	
	1948	1947	1948	1947
Jan.	189,191	181,245	19,554	18,124
Feb.	190,098	183,189	18,596	18,372
Mar.	182,340	182,529	10,458	18,725
Apr.	149,692	179,428	8,205	14,591
May	184,568	179,400	18,623	19,800
June	186,425	178,400	18,002	15,700
July	184,286	174,300	14,036	14,100
Aug.	.....	181,697	.....	18,346
Sept.	.....	179,872	.....	19,397
Oct.	.....	187,009	.....	19,786
Nov.	.....	188,342	.....	18,316
Dec.	.....	189,886	.....	19,454
Ave.	.....	182,108	.....	17,893



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$16,161	$13,454	$12,214	$13,124
Federal Gross Debt (billions)	$252.2	$252.0	$253.2	$259.0
Bond Volume, NYSE (millions)	$13.6	$13.7	$11.5	$16.4
Stocks Sales, NYSE (thousands)	4,132	3,352	2,850	3,532
Loans and Investments (billions)†	$63.7	$63.3	$63.4	$64.7
United States Gov't. Obligations Held (millions)†	$34,744	$34,652	$34,904	$39,022

† Member banks, Federal Reserve System.

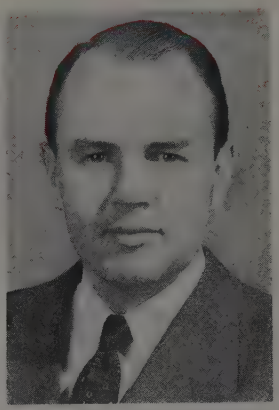
PRICES

STEEL's composite finished steel price average	$93.86	$93.86	$93.86	$75.41
All Commodities†	169.4	168.0	169.2	158.1
Industrial Raw Materials†	182.0	180.9	182.8	173.6
Manufactured Products†	165.7	163.9	164.9	152.7

† Bureau of Labor Statistics Index, 1926=100.

Men of Industry

GEORGE W. PERRY



CROSBY M. KELLY

M. P. WINTHER

George W. Perry has been appointed advertising manager of Cook Electric Co., Chicago. He is a former member of the advertising department, Kellogg Switchboard & Supply Co. The Cook Electric Co. produces expansion joints for pipeline and chemical processing industries and electrical and electronic devices for aircraft and general industrial applications.

—o—

John W. Colgan has been elected a director of Handy & Harman, New York. Mr. Colgan is sales manager of the firm.

—o—

The following persons were elected directors of Baldwin Locomotive Works, Philadelphia: **A. W. Robertson, Gwilym A. Price** and **L. B. Osborne,** chairman of the board, president and senior operating vice president, respectively, of Westinghouse Electric Corp. The election of the following personnel as officers of the company was also announced: **James R. Weaver,** vice president in charge of manufacturing, Eddystone Division; **John S. Newton,** vice president in charge of engineering, Eddystone Division; and **R. Nevin Watt,** vice president in charge of sales, Eddystone Division.

—o—

G. A. Gilbertson has joined the Frank G. Hough Co., Libertyville, Ill., as vice president. He recently resigned as assistant sales manager of the Industrial Power Division, International Harvester Co.

—o—

Erie Foundry Co., Erie, Pa., announces that **D. A. Currie** has been re-elected president and treasurer, **F. F. Clark** has been elected honorary vice president, **James A. Currie,** first vice president, **Robert N. Yates,** second vice president, and **C. D. Pinney,** secretary.

—o—

Crosby M. Kelly has joined Rapids-Standard Co. Inc., Grand Rapids, Mich., as director of advertising and sales promotion. He has been with Ford Motor Co., Dearborn, Mich., for the past seven years, where he was successively in aircraft engine production during the war, director of supervisory training, director of Ford Merchandising School, and this spring, general manager of the "World Premier" introduction of the 1949 Ford product line at the Waldorf-Astoria Hotel, New York.

—o—

R. E. W. Harrison has resigned as vice president, Chambersburg Engineering Co., Chambersburg, Pa., to devote his time to a limited number of business interests, principally in a technical advisory capacity.

—o—

Keystone Steel & Wire Co., Peoria, Ill., announces election of **E. J. Sommer** as director for a three-year term to succeed **R. J. Kavanagh,** whose term expired. **D. P. Sommer** and **Theodore C. Baer** were re-elected for three-year periods.

—o—

Crocker-Wheeler Electric Mfg. Co., division, Joshua Hendy Corp., Ampere, N. J., has reopened its Buffalo branch office in the Ellicott Square Bldg., Buffalo. The new Buffalo branch, operating directly under the New York district manager, is headed by **Louis E. Rau,** who, for several years, has been on the staff of the New York district office.

—o—

M. P. Winther has been appointed vice president and director of engineering, Eaton Mfg. Co., Cleveland. He has been associated with the company since 1946, when Eaton acquired Dynamatic Corp., Kenosha, Wis., of which Mr. Winther was president and general manager. Mr. Winther also has been a director of Eaton Mfg. Co. since March, 1947. His office will now be located at Cleveland in the general office of Eaton Mfg. Co. He will also continue as president of Dynamatic Corp.

—o—

Effective Nov. 1, 1948, new appointments by Carborundum Co., Niagara Falls, N. Y., will be as follows: **E. B. Forse,** manager of the Refractories Division, Perth Amboy, N. J., will be appointed assistant vice president. In this capacity he will undertake special assignments relative to problems arising from the expanding markets for refractories and crude silicon carbide. For the present, his headquarters will remain at Perth Amboy. **C. E. Hawke,** director of sales, will become manager, Refractories Division, succeeding, Mr. Forse. **E. R. Baxter** will be appointed director of sales and sales administration to succeed Mr. Hawke. **G. R. Rayner Jr.** will become assistant director of sales administration under Mr. Baxter, and will be in charge of sales administration at Niagara Falls and in the district offices.

—o—

Hyster Co., Portland, Oreg., announces the appointment of **William Morrow** as chief accountant for the Portland office. Associated with the company since 1939, Mr. Morrow is

TINNERMAN
Speed Nut
SAVINGS STORIES

HOW WORTHINGTON Saves 30% IN ASSEMBLY TIME

RECENT TIME STUDY TESTS—conducted by the Methods Department of Worthington Pump and Machinery Corporation in their Holyoke, Massachusetts Air Conditioning and Refrigeration plant—prove that SPEED NUTS* can be applied in 30% less time than other fasteners.

Important time savings like this are possible for Worthington because SPEED NUTS . . .

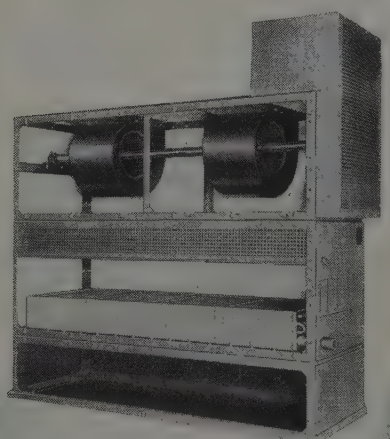
1. **are self-retaining—hold themselves in bolt-receiving position**
2. **eliminate welding, clinching and riveting**
3. **reduce materials handling**
4. **do not clog—save the time required to mask fasteners before painting or tap after painting**
5. **speed up blind assembly attachments by compensating for inherent misalignment of holes punched in sheet metal panels.**

Shorter assembly schedules mean more units produced . . . more profit for your company. In many cases, SPEED NUTS improve product quality, save assembly time and money, and insure delivery of product in good condition. Write us for details on our Fastening Analysis Service or contact your Tinnerman representative. He's listed in major city telephone directories. Tinnerman Products, Inc., Cleveland 13, Ohio.

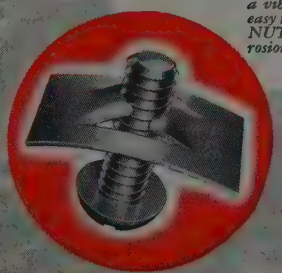
In Canada: Dominion Fasteners Limited, Hamilton • *In England:* Simmonds Aerocessories, Ltd., Treforest • *In France:* Aerocessoires Simmonds, S. A. Paris

Assembler aligning panel hole with SPEED NUT prior to inserting bolt—a simple, quick operation.

Zip . . . zip and the panel is secured with a vibration-proof attachment. Panels are easy to remove for servicing of units—SPEED NUTS never "freeze" on threads despite corrosion-producing conditions in these units.



More than 150 SPEED NUTS are used in the assembly of this Worthington Model AVY Commercial Air Conditioner. Panels are removed to show SPEED NUTS in bolt-receiving position.



TINNERMAN Speed Nuts

*Trade Mark Reg. U. S. Pat. Off.

MORE THAN 4000 SHAPES AND SIZES

being transferred from the plant at Danville, Ill., where he served as purchasing agent. **R. E. Stiegele,** former district representative in the southeastern territory, has been transferred to the general sales department in Portland, to handle special sales assignments for **Philip Hill,** general sales manager. He is succeeded by **W. R. Hunt** in the southeastern territory. **Paul Brainard,** former assistant supervisor of hoist design for Hyster Co., has been named head of the newly created Hyster engineering standards department.

—o—

Arcos Corp., Philadelphia, manufacturer of stainless steel and alloy welding electrodes, announces that **Charles B. Culbert Jr.** is now located in the Boston area as company representative.

—o—

M. J. Danneker has been appointed supervisor of the employment department at Midland Works, Midland, Pa., Crucible Steel Co. of America. He previously was employed in the industrial relations department at the Midland Works.

—o—

David M. Gans has been appointed director of research, Arco Co., Cleveland, manufacturer of automotive, industrial and other special coatings.

—o—

Gordon W. Hostetter has been appointed director of labor relations for Associated Industries, Cleveland, succeeding **W. R. Meredith,** who resigned to become a member of the faculty of Case Institute of Technology. Mr. Hostetter has had eight years' experience in contract negotiations, and for the past year has been a private consultant in Chicago, where he concentrated entirely in this aspect of labor relations. Previously he had been with National Metal Trades Association, which he joined in 1941 at Chicago, and was later transferred to its New York office as an adviser on all phases of industrial relations, but specializing on collective bargaining agreements.

—o—

Wilbur H. Norton, former president, Montgomery Ward & Co., Chicago, and associated with that company since 1932, has joined the staff of General Motors Corp., Detroit, working on special assignments reporting to **C. E. Wilson,** president.

—o—

Walter A. Fairchild has been appointed special representative of Bridgeport Steel Co., Bridgeport, Conn. He had been connected with Bliss & Laughlin Inc. in New England for the past 12 years.

—o—

Samuel M. Gahagen, formerly of Rustless Iron & Steel Corp., Baltimore, has been appointed chief metallurgist by Jessop Steel Co., Washington, Pa. Mr. Gahagen previously served in metallurgical and other technical capacities with American Steel & Wire Co., Crucible Steel Co. of America, and Vanadium Corp.

—o—

William H. Oliver, acting assistant superintendent of the iron department, Louisville Works of American Radiator & Standard Sanitary Corp., Pittsburgh, has been promoted to general superintendent of the Bond plant at Buffalo, which plant manufactures cast iron boilers. He joined American-Standard in 1936.

—o—

Wallace F. Ardussi, sales and engineering executive, has purchased Variety Machine & Stamping Co., Cleveland, which operates as manufacturer of metal stampings, assemblies, and tools and dies. Mr. Ardussi, who came to Cleveland in 1943 as chief engineer, Machinery Division, Industrial Rayon Corp., was elected vice president, Hupp Corp., in charge of sales and engineering development in 1945. He resigned in February, 1948, to enter private business.

—o—

Roy S. Rankin has resigned as vice president and director of sales, Harris Calorific Sales Inc., Detroit, producer of gas welding equipment, to become manager of Progressive Welder Sales Co. of Michigan, Detroit. Mr. Rankin joined Harris Calorific in 1943, following nine years with Air Reduction Sales Co.

—o—

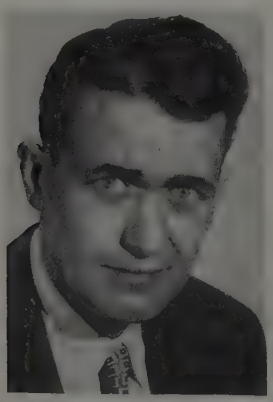
William C. Cook has joined Vic Pastushin Industries Inc., Los Angeles, his appointment announced in conjunction with the company's expanded program of aircraft sub-contracting and manufacture of sheet metal and extrusion components. Mr. Cook was with the Santa Monica plant of Douglas Aircraft Co. for 18 years.

—o—

Hydraulic Press Mfg. Co., Mt. Gilead, O., announces appointment of **Carl J. Lamb** as consulting engineer. His duties will embrace the investigation and reporting to management on projects dealing with markets, products and other matters having a bearing on the company. In the past Mr. Lamb has served in engineering and commercial capacities with Westinghouse Electric Corp., Sharples Corp., and Hydropress Inc. Prior to joining Hydraulic Press Mfg. Co., he was head of the eastern office of a consulting engineering firm in the machinery and equipment design field.

—o—

A. W. Rice has been appointed company auditor, Mack Trucks Inc., New York. For 27 years concerned with the company's auditing affairs, Mr. Rice joined Mack in 1921 as cashier in its Albany Division. Since 1936 he has been auditor for all of the



GORDON W. HOSTETTER

WILLIAM H. OLIVER

CARL J. LAMB

"I thought I'd *Never*

"find a Steel to do the job!"

"*Unique* wasn't the word. It was *fantastic*.

"I needed a steel that could be twisted, curled, stamped, formed and tempered in a dozen different ways . . . a steel that was VERSATILE with a capital 'V'.

"As usual, I got one of Gensco's men on the phone and told him what I was after.

" 'Relax,' he said, 'you haven't even got a problem. GENSCO ANNEALED SPRING STEEL will do the job!'

"Frankly, it gave me the surprise of my life. Seems to me there's no limit to the VERSATILITY of Gensco Annealed Spring Steel."

It can do the job that's troubling you, too. Write or phone today.

Thicknesses from .005 to .187, sheared, slit and packed to exact requirements.

the Exact Steel for Your Individual needs

COLD FINISHED BARS • SHAFTING • TEMPERED AND ANNEALED SPRING STEEL • DRILL ROD • SHIM STEEL • COLD ROLLED STRIP STEEL • COILS AND STRAIGHT LENGTHS • ROUND EDGED STRIP STEEL • FEELER GAUGE • ROUND WIRES • STEEL BALLS

GENSCO

GENERAL STEEL WAREHOUSE CO., INC.

1830 N. KOSTNER AVE., CHICAGO 39, ILL., BEImont 5-4266

OTHER OFFICES

★ CINCINNATI Dunbar 5174
★ MILWAUKEE Broadway 2-7629
★ ST. LOUIS Wydown 1368
★ NEW YORK Vanderbilt 6-2750
★ MINNEAPOLIS Bridgeport 1119
★ GRAND RAPIDS Grand Rapids 3-6328

company's 67 direct factory branches. In assuming his new position, Mr. Rice succeeds the late **H. S. Conklin.**

—o—

Stanton E. Winston, dean, Evening Division, and professor, mechanical engineering at Illinois Institute of Technology, has resigned as director of the annual Midwest Power Conference. **Roland A. Budenholzer,** professor, mechanical engineering at Illinois Tech., has been named to succeed Dean Winston, who has served as conference director since 1940.

—o—

Willis C. Toner has been appointed plant manager of the new television tube plant at Ottawa, O., for Sylvania Electric Products Inc., and **Henry A. Bair,** formerly general foreman, has been appointed manufacturing superintendent, cathode ray department, at the company's main plant, Emporium, Pa.

—o—

Effective Nov. 1, **Robert E. Rudd** will become director of merchandising, Buick Motor Division, General Motors Corp.; **John W. Waddell** will become Pacific Coast regional manager; and **Frank Bridge** will be Chicago zone manager.

—o—

W. W. Elliott, founder, Elliott Mfg. Co., Binghamton, N. Y., manufacturer of flexible shafting, has retired from the firm, and has sold his interest to his son, **Boyd W. Elliott,** a partner in the business.

—o—

Roy W. Johnson, general manager of the affiliated manufacturing companies department of General Electric Co., Schenectady, N. Y., has been elected a vice president of the company.

—o—

P. R. Baus has been appointed manager of the recently opened branch office in Los Angeles of Jack & Heintz Precision Industries Inc., Cleveland. This office is located at 409 Hollywood Professional Bldg., Hollywood, Calif.

—o—

Harman Schwarts, president, Rochester Scrap Baling Co., has been elected president of the Western New York Chapter, Institute of Scrap Iron & Steel Inc. **T. G. Hanlon,** manager, Buffalo office, Luria Bros. & Co., was named vice president, and **Leo Chapin,** Chapin & Fagin Inc., re-elected secretary-treasurer.

—o—

Tin & Chemical Corp., Baltimore, recently formed to engage in the detinning of tin scrap and other allied activities at a new plant which the company will erect in the Curtis Bay

CARL F. TER WEELE

Appointed export manager, Farrel-Birmingham Co. Inc., Ansonia, Conn. Noted in STEEL, Sept. 20 issue, p. 88

area at Baltimore, announces the following men as officers: **Frank J. O'Brien,** president; **I. D. Shapiro,** vice president and general manager; **Walton S. Smith,** vice president; **Hubert E. Rogers,** secretary; **John F. Condon,** assistant secretary; **Alexander Rogers,** treasurer; and **Alexander Papi,** assistant treasurer.

—o—

Promotions announced by Alabama By-Products Corp., Birmingham, are: **H. M. Cowart,** elected a director, member of the executive committee, executive vice president and treasurer. He has been with the company since 1918, and has recently served as vice president. **Frederick G. Koenig Jr.** has been elected assistant secretary. He formerly was with the legal department of TVA. **J. Elbert Johnson** was elected assistant treasurer. He has been with the company since 1930 except for war service.

—o—

C. P. Corrigan, formerly sales representative, has been appointed district sales manager at Cleveland for the Ramapo Ajax Division, American Brake Shoe Co., New York. Since joining the company in 1939, Mr. Corrigan has held several positions in both the sales and purchasing departments of the company.

—o—

Monarch Aluminum Mfg. Co., Cleveland, announces election of **Edward C. Bloomberg** as executive vice president. He will also continue as treasurer of the company, which latter position he assumed in 1947.

—o—

Fred B. Riggan, formerly chief metallurgist, Key Co., East St. Louis, Ill., has been promoted to the position of foundry manager and general superintendent. **Arnold Czechowicz** was appointed assistant foundry superintendent, and **Robert Jacoby** was advanced to the position of chief metallurgist.

—o—

Ekholm Associates, Boston, management consultant and industrial engineer, announces that **Malcolm K. Sheppard,** associate, has been appointed general manager of Ekholm Associates, Cleveland.

—o—

Winston H. Jones, assistant director of sales and advertising manager, Conlon-Moore Corp., Conlon Division, has been appointed director of sales, succeeding **Roy E. Andree,** resigned. **James C. Witty** has been appointed engineer in the ironer department.

—o—

Edward C. Miller has been promoted from manager of the Buffalo, N. Y., assembly plant, Ford Motor Co., to manager of the company's Dearborn, Mich., assembly plant. **William J. Swallow,** former assistant manager of the Atlanta plant, succeeds Mr. Miller as manager of the Buffalo plant.

—o—

Fedders-Quigan Corp., Buffalo, has appointed **Henry F. Goetz** as sales engineer, and **William W. Reeves** as applications engineer of the Condenser Division.

—o—

D. W. Boylan, comptroller and secretary, Lustron Corp., Columbus, O., and **H. S. G. Verlander,** secretary-treasurer, Equitable Equipment Co. Inc., New Orleans, La., have been elected to membership in the Controllers Institute of America.

—o—

American Management Association, New York, announces that **Henry J. Howlett** has resigned as secretary, which position he has held for the past 13 years, to become president of Container Laboratories Inc., succeeding the late **E. A. Throckmorton. Victor L. Persbacker** has been appointed auditor, American Brake Shoe Co., New York, and in addition will continue to serve as assistant comptroller of the company.

—o—

John T. Lucas has been appointed supervisor of quality control and customer service, Huntington radio tube plant of Sylvania Electric Products Inc., New York. He formerly was supervisor of product engineering at the company's Altoona, Pa., radio tube plant. **William J. Hopkins,** formerly New England sales representative for Burgess Battery Co., has been appointed eastern division manager for renewal tube sales de-

JAMES K. FULKS

Vice president-manufacturing, Ex-Cell-O Corp., Detroit, has been elected a director. Noted in STEEL, Sept. 20, p. 90

JOHN F. MILLER

Appointed sales manager, Machine Tool & Cutting Tool Divisions, Ex-Cell-O Corp. Noted in STEEL, Sept. 20 issue, p. 90

D. H. McIVER

Appointed sales manager, Aircraft & Miscellaneous Parts Divisions, Ex-Cell-O Corp., Detroit. Noted in STEEL, Sept. 20, p. 90

partment, Radio Tube Division, for Sylvania.

—o—

Bliss & Laughlin Inc., Harvey, Ill., announces appointment of **John H. Bryan Jr.** as district sales manager of its New York office. He has been located in both the New York and Hartford, Conn., offices of the company since his return from military service. He succeeds his father, **J. Harvey Bryan Sr.,** who has represented Bliss & Laughlin Inc. in the New York district since 1930.

—o—

A. A. Vetter has been appointed consulting sales engineer for Buhr Machine Tool Co., Ann Arbor, Mich. For the past seven years he has been plant superintendent.

—o—

Robert A. Stauffer has been appointed assistant director of research of National Research Corp., Cambridge, Mass., and **James H. Moore** has been promoted to director of the metals department, succeeding Mr. Stauffer.

—o—

Edmund B. Kinne has been appointed product engineer, McConway & Torley Corp., Pittsburgh. Associated with the corporation since 1943, Mr. Kinne has served as production engineer and as assistant to the general superintendent until his current appointment. He had previously been with American Steel Foundries as assistant chief inspector at the East Chicago plant.

—o—

Stanislaw T. Jazwinski, since 1946 chief metallurgist, Barium Steel Corp., New York, is now operating vice president of Detroit Steel Casting Co., Detroit, subsidiary of Barium Steel Corp. A native of Poland, he was active in metallurgical work there and in Germany and England prior to coming to the United States. For several months he served as research engineer for the Brazilian government, and joined Barium Steel in 1946. He is also a vice president, Sheffield Iron & Steel Co., Sheffield, Ala., another Barium subsidiary.

—o—

W. F. Godejohn has been appointed assistant to the president, Harbison-Walker Refractories Co., Pittsburgh. For many years Mr. Godejohn was engaged in the refractories industry in the St. Louis area, and was formerly Missouri district superintendent of Harbison-Walker, with jurisdiction over Vandalia and Fulton Works.

OBITUARIES . . .

Newman Ebersole, 61, director of purchases, Armco Steel Corp., Middletown, O., died Sept. 22 in Cincinnati. He became associated with Armco in 1911. In 1944 he assumed the position of director of purchases.

—o—

Charles V. Hale, president and general manager, Saginaw Sheet Metal Parts Corp., Saginaw, Mich., died recently.

—o—

Charles F. Schriner, pioneer in the manufacture of steel barrels, and owner of the former National Steel Barrel Co., Cleveland, died Sept. 27. At the time of his death he was superintendent of the Taylor Mfg. Co., Cleveland.

—o—

Andrew D. Smith, 67, associated in Cleveland for more than 20 years with Bethlehem Steel Corp., died recently. He was a metallurgist and special representative with the Bethlehem organization when he retired a year ago. Concurrently, he had been metallurgical consultant for numerous steelmaking and foundry companies. A private interest was as an officer of National Metal Abrasive Co., Cleveland.

—o—

Abraham M. Goldish, 75, owner of the American Iron & Metal Co., Marietta, O., died Sept. 21.

—o—

Kirke R. Wilson, 59, Buffalo industrialist, died recently in a Detroit hospital. He was president, I. R. Wilson, manufacturer of tools for repairing Ford automobiles, marine conversions of the Ford motor and industrial generating equipment.

—o—

Clem H. Franks, 52, president, Teletype Corp., Chicago, subsidiary of Western Electric Co. Inc., died Sept. 18. He also was president, Teletypesetter Corp., subsidiary of Teletype. Prior to 1943, he had served as engineer and superintendent of two Western Electric plants.

—o—

William L. Briesmeister, 64, former construction engineer, Worthington Pump & Machinery Corp., Harrison, N. J., died recently.

—o—

George Lanier, 68, president, West Point Mfg. Co., West Point, Ga., died Sept. 18.

—o—

Ben Katz, 53, partner in the Katz Bros. scrap metal business in Milwaukee, died Sept. 22.

—o—

W. B. Lawson, 64, president and treasurer, Ferro Chemical Corp., subsidiary, Ferro Enamel Corp., Cleveland, of which he also was a director, died Sept. 28 when thrown from a horse.

MAGNETS & CRANE CONTROL

Overhead Crane, equipped with EC&M Crane Control and 65-inch diameter All-Welded Magnet, serves all parts of eastern scrap yard.

"This large lift by 45-inch All-Welded Magnet was made under normal conditions," reports our Philadelphia Office.

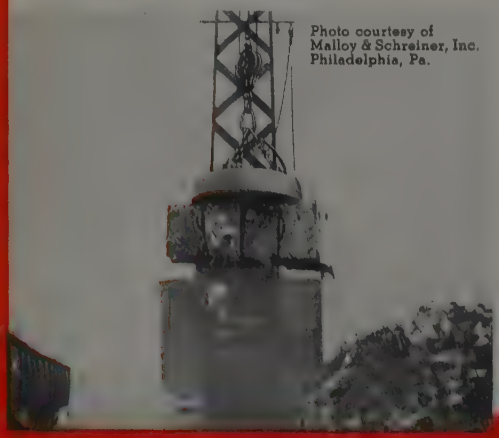


Photo courtesy of Malloy & Schreiner, Inc. Philadelphia, Pa.

Four bales weighing from 480 to 600 pounds each taken from cars by 36-inch magnet

EC&M builds the Type SW *All-Welded* Lifting Magnet in sizes from 39-inch diameter up for boom and overhead cranes. For cranes of limited capacity, such as small truck-cranes, EC&M builds the Type R circular magnets in sizes of 29-inch diameter and smaller. EC&M also builds a complete line of crane control, both a-c (Bulletin 930) and d-c, (Bulletin 921) for the overhead crane. When buying overhead electric cranes and magnets, specify EC&M for full coverage.

For heavy duty continuous scrap-handling, the EC&M Type SW *All-Welded* Lifting Magnet has *no equal*. The *All-Welded* design gives tight construction—the SW coil-winding is *doubly-sealed* against moisture—pole shoes can *not* loosen and form air gaps. Only EC&M's Type SW Magnet has *both* pole shoes welded.

For specific information on magnets, advise *type* and *capacity* of crane; for control information, give *horsepower* and *voltage* of motors for *each* motion on the crane, so that we can write you fully when sending the descriptive bulletins.

EC&M Circular Magnets come in eleven sizes for all handling needs. Ask for Bulletins 900 and 904.

29-inch diameter Magnet on truck crane receives 36-volt power directly from truck.

THE ELECTRIC CONTROLLER & MFG. CO.

2711 EAST 79TH STREET • CLEVELAND 4, OHIO

Engineering News . . . AT A GLANCE

STRENGTH-ADDING COATING— Coating of steel gear wheels with bronze by a process developed by the Germans is reported to add greater strength, and longer life especially in those applications where great shock is exerted, according to the Office of Technical Services, Washington. Process involves the use of a special bronze, and gas-heated furnaces are used for melting. The gears are placed in a gray cast iron mold lined with fireclay. The bronze is cast into the annulus between each gear and the container. After cooling, each coated gear is removed and packed in a graphite sand mixture. This is followed by diffusion heat treatment and final machining.

SPINS FASTER THAN SPEED OF SOUND— Tip-speed of the last-stage wheels of the 35-foot 70,000-pound, 23-stage turbine rotor incorporated in the 100,000-kilowatt turbine-generator set being built by General Electric for Public Service Electric & Gas Co.'s Sewaren, N. J., station, is reported to rotate about 1390 feet per second—well above the speed of sound. Unit is designed for operating steam conditions of 1500 pounds gage and 1050° F.

CHECKS 'EM FOR SIZE—Negative atomic ions of the heavier metallic elements now can be successfully measured through development, by Dr. Willard H. Bennett, National Bureau of Standards, of a specially designed vacuum tube that provides a greatly simplified and flexible radio-frequency mass spectrometer. Previously such ions, consisting of atoms with extra electrons having very low energies of formation, were difficult to detect, identify and measure because of the rapidity with which they dissociated in short distances of travel—that is before reaching a measuring electrode. Special characteristics of the development also make it applicable to other uses, including the mass spectrometry of positive ions.

PALLETS ON WHEELS— Pallets consisting of steel frames 2 feet wide and 5 feet long running on wheels along 22-gage tracks are used in the plant of Belle City Malleable Iron Co., Racine, Wis., to transport molds for pouring. The miniature edition of a railroad line, referred to by the company as its "pallet line", is reported to provide much flexibility for handling many different size molds with less physical effort. The "line" is so engineered that it is possible to pour any one of the four types of iron made by the company.

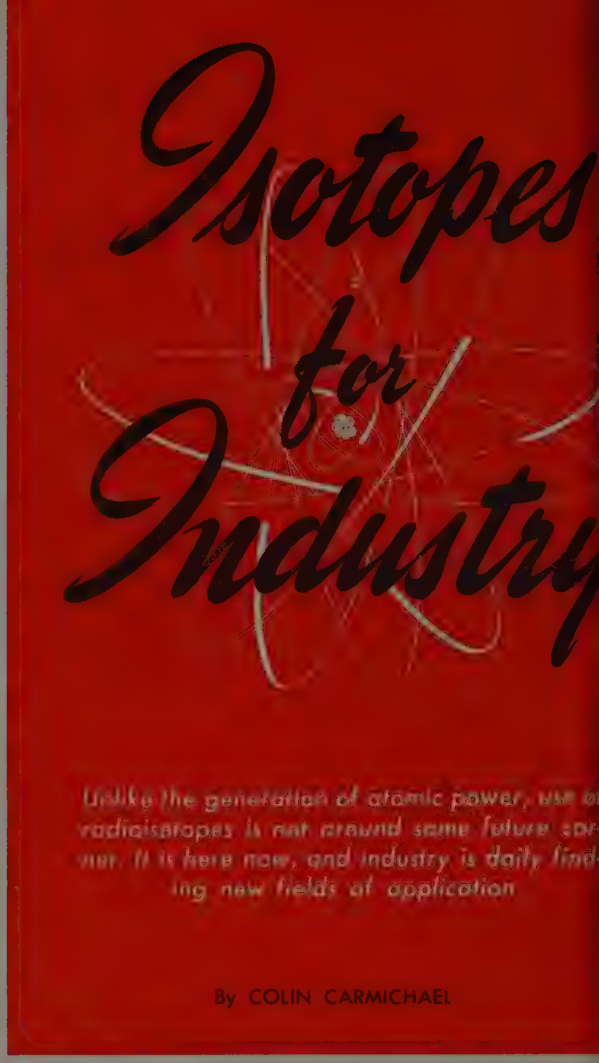
FAST REBUILD JOB— Use of the Unionmelt welding process enabled one company to build up the tapered bore of a 2-ton forge hammer in a matter of 8 hours, according to Linde Air Products Co., New York. In the operation, the ram was first machined to remove impregnated copper from previous shimming. It then was wedged and spot welded into slots cut in circular pieces of plate and placed on four dead-rolls for ease of positioning. Welding head, provided with a 24-inch extension, was mounted on a carriage and adjusted to the proper level so that the nozzle could enter the bore. Beads of deposited weld metal then were laid on in the longitudinal direction, the ram being turned one-half turn for each weld. Some 30 pounds of metal were deposited to reduce the diameter of the bore by ½-inch. During the process, it was necessary to preheat the ram to 600° F, due to the steel's composition.

NOW AN INDUSTRY "TOOL"—Use of radioisotopes is no longer around some future "corner"—it is here now, and within industry's grasp from the cost angle. Furthermore, companies now using the new "tool" are daily finding new additional fields or application. Key to successful application of radioisotopes is the extreme sensitivity of radiation detectors. At Ford Motor Co., for example, by coupling the highly penetrating gama rays given off by a radioisotope with a sensitive radiation detector, company engineers developed a clever device for measuring the level of molten metal in a cupola. (p. 74)

"BUTT" JOINING LINKS — Although the lap-weld today is still a part of the hand-forge process of chainmaking, the huge volume of chain produced mechanically is all butt-welded. In the process employed by Cleveland Chain & Mfg. Co. Cleveland, an automatic forming machine first takes the wire or rod from the coil, cuts it off squarely to proper length, then shapes the material in form of a link, butting the ends together for the weld. A high-amperage electrical current is sent through the butted ends, causing the two ends to fuse together. This fusing operation is done with the aid of mechanical dies that exert pressure around the weld in order to keep the fusing metal at the joint the same size as the rest of the link. (p. 76)

NO FLUX REQUIRED—Something relatively new in the way of furnace brazing is the joining of stainless steels and other high-chromium alloys without flux in highly purified protective atmospheres. Although the technique was used for some time in laboratories, it is only recently that it became appreciated production-wise. In the new technique, according to H. M. Webber of General Electric Co., the copper wets and creeps over the surfaces of the high-chromium alloys as well and as freely as on low-carbon steel under ordinary conditions. Resulting surfaces are bright and clean, requiring no subsequent cleaning operations. To date, several batch-type furnaces are being used for this type of work. (p. 79)

Isotopes for Industry


Unlike the generation of atomic power, use o
radioisotopes is not around some future cor
ner. It is here now, and industry is daily find
ing new fields of application

By COLIN CARMICHAEL

GREAT prominence has been given to the fantastic possibilities of atomic power. Large electric generating plants, we are told, will have their year's fuel supply delivered by parcel post, and atomic-powered bombers will girdle the earth without refuelling. Speculation of this kind has tended to obscure the significance to industry of another, highly important, phase of atomic development—the application of radioactive isotopes. Unlike the generation of atomic power, the use of radioisotopes is not around some future corner. It is here now, and industry is daily finding new fields of application.

Providing a relatively cheap source of high-powered radiation, microscopic quantities of radioactive isotopes are performing services that formerly required expensive x-ray equipment, or high-priced natural radium. Prior to the successful design and construction of nuclear piles (or reactors, as they are now being termed) the production of artificial radioactivity involves the use of huge cyclotrons with a relatively minute output. As an example of the difference in cost, one millicurie (an amount of radioactive material having one-thousandth of the effect of a gram of radium) of the isotope carbon 14 would cost approximately a million dollars if produced in a cyclotron. The Atomic Energy Commission now sells this isotope for $50 per millicurie.

Where do such products fit into industry? Radioactive materials continually emit three types of radiation which, for convenience, have been classified as alpha, beta, and gamma rays. Of these the gamma rays are the most penetrating. They are similar to x-rays and some of the most promising applications are those in which gamma radiation substitutes for x-rays.

Where the voltage of an x-ray tube limits the depth of penetration of the rays, or where the tube cannot be conveniently located with respect to the section being studied, gamma-emitting radioactive materials offer a neat solution. Being confined to a small capsule, the material can be placed in a limited space. Furthermore, the penetrating power is exceeded only by the radiation from elaborate machines such as the betatron.

Key to the successful application of radioisotopes is the extreme sensitivity of radiation detectors. For instance in tracer work (where atoms "tagged" by rendering them radioactive are followed to see where they go), instruments can detect quantities as minute as a billion-billionth of a gram. A gram itself is only 1/28-ounce.

By coupling the highly penetrating gamma rays given off by a radioisotope with a sensitive radiation detector, engineers at the Ford Motor Co. have developed an ingenious device for measuring the level of molten metal in a cupola. Two vertical slide rails outside the cupola are located at opposite ends of a diameter. One carries a small quantity of a gamma-emitting radioisotope and the other supports a Geiger-Muller radiation counter. As the two are raised and lowered simultaneously the percentage of radiation reaching the counter changes, according to whether the rays must pass through metal which absorbs a high percentage of them, or through the gas above the metal which permits many to get through. The level in the cupola therefore is easily determined by noting the height at which the counter indications change.

Radiation-absorbing power of materials also is utilized in a new type of thickness gage for measuring or controlling the thickness of sheet materials. Here the highly penetrating gamma rays are not needed, and the much weaker beta rays can be used. Beta rays are actually electrons—the same particles which stream through radio tubes. A convenient source is carbon 14 which gives off an exceptionally steady radiation. This material is used in a thickness gage developed at the Goodyear Research Laboratory for measuring thin films of Pliofilm, Fig. 2. A small amount of carbon 14 on one side of the film produces minute electrical currents in an ionization chamber on the opposite side. These currents are proportional to the number of electrons which get through the film and therefore are inversely proportional to the thickness. The amplified current is used to actuate a meter indicating the thickness. Present accuracy of measurement is on the order of one hundred-thousandth of an inch, (*Please turn to Page* 108)

Fig. 1 (above)—One face of the Oak Ridge reactor. This reveals plugged holes used for experimental purposes with work proceeding outside the thick concrete radiation shield

Fig. 2 (right)—A radioactive isotope, by-product of the nation's atomic energy plants, is heart of a new gage for measuring thickness of Pliofilm and other thin films on continuous production equipment. Developed by W. E. Morris, shown here, of the research laboratory, Goodyear Tire & Rubber Co., Akron, the device is capable of measuring material as thin as 0.001-inch

Chainmaking

By R. BRUCE VASEY
Asssitant to the Vice-President
Cleveland Chain & Mfg. Co.
Cleveland

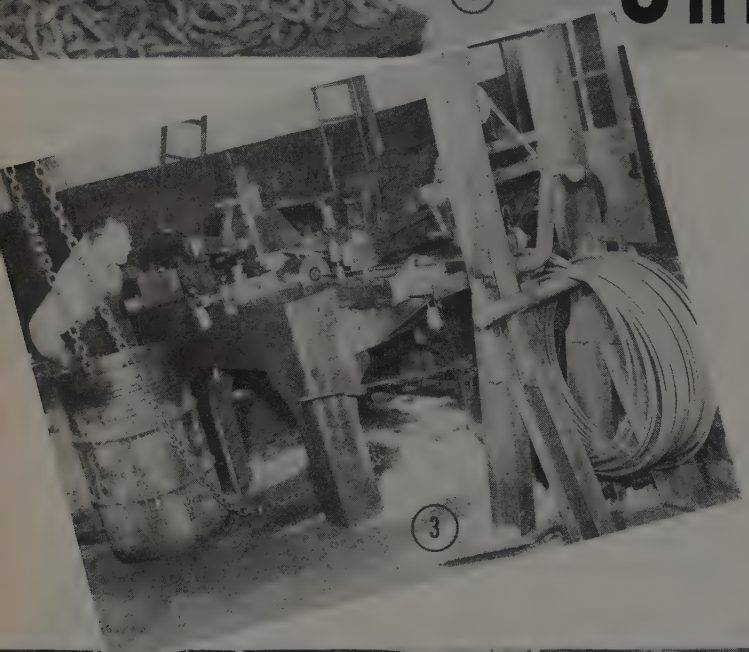


Fig. 1—Wire and rod is shipped in via rail car or motor truck and stored in this area in sections according to product diameter. Shop truck shown handles approximately 12 coils (2000 pounds) of wire per load

Fig. 3—Coil of 21/32-inch wire is being formed into ⅝-inch chain in this cold-forming machine. One hundred eighty-pound coil requires 15 minutes to run through former. After forming, chain drops to floor from where it is transferred up over a pulley and into a steel barrel for subsequent delivery to welding machines

Fig. 4—Approximately six links of ⅝-inch chain is welded by the resistance method at a temperature of 2500 degrees F. Both forming and twisting machines and welding equipment was designed and built by the company's engineers. The units average about 220 pounds per hour

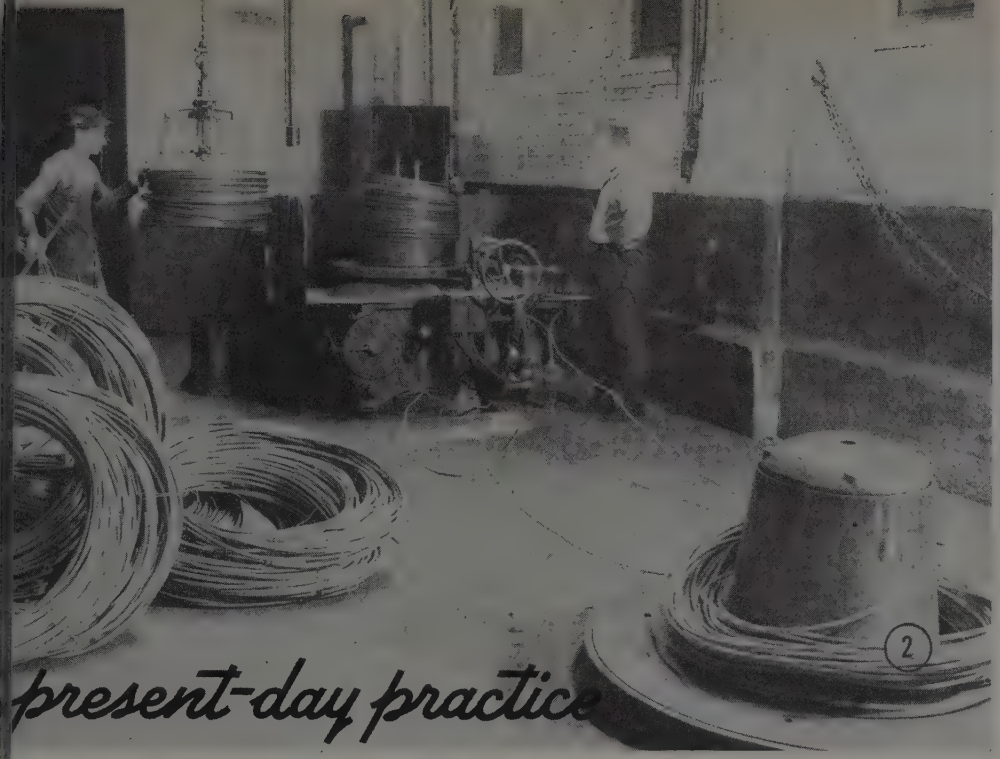


Fig. 2 — Using SAE 1010 rods, drawing operation produces wire in sizes of ¼ to 17/32-inch inclusive at a rate of 25,000 pounds daily—60 tons per week. Tungsten carbide dies are used for drawing which are dressed with diamond dust. Wire is now taken to forming machines

IN YEARS gone by, all chain was made by hand. Today, batteries of machines produce the great tonnage of chain used in this country and throughout the world in industry, commerce, agriculture, transportation and countless other applications.

The hand-forging process, or "fire-weld", is still existent, but its use is largely confined to the making of heavy iron chains not readily adaptable to machine production. As compared to almost universal acceptance and use of iron chain some 40 years ago, steel chain now makes up by far the largest percentage of the products in modern consumption.

Steel wire, or rod as it is termed in its primary annealed stage, is the material from which most of the commonly used chain is produced. It is a mild 10-10 carbon form of steel that may come to the chain manufacturer in bar, rod or wire form depending upon requirements.

The major portion of all steel used in chain-making is received in coils of bright basic wire. Most of the large chain factories today, however, are equipped to draw a good part of the wire they use in production. Rod stock can then be ordered from the mill, which is also delivered in rough coil form. Drawing this rod down to exact size removes its surface scale, left by annealing, and "cold-works" the material into a new, harder grain structure. It is then, as bright basic wire, ready for the chain making machines.

Bar stock is required only for the larger sizes of chain from approximately ¾-in. and up. It is used in both the hot-rolled, annealed form and as cold-drawn steel. Mostly, "green" hot-rolled bars are used in the hand-forging process, but cold-drawn steel is also often welded by this method. For the automatic machines, bars must be cold-drawn to exact size the same as wire. Bar stock is distinguished from rod or wire simply because—although it is round material—it is in straight pieces, whereas the other is stocked in coils.

From the chain manufacturer's viewpoint, his product falls into two broad classifications, welded and weldless chain. Of the two, welded chain is by far the older. Its use and production by the hand-forging, lap-weld method dates back many centuries. As previously mentioned, all of this chain was made of iron, at least wherever utility was the main consideration.

Weldless chain is a more modern development and only began to be produced when automatic chain-making machinery came into use. As its name implies, this type of chain is made from unwelded links which are simply joined together by various style loopings of the wire. In large sizes it has considerable tensile strength and its low cost has created a wide market for it in the home, around the farm and in countless other places.

The weldless chain group also includes flat metal chains, links of which are stamped out of strip metal and joined together in the same operation. Window sash chain is one of the types in this class. There are several others, all somewhat similar in design, and for the most part they are used to run over pulleys in operating regulators, etc.

It is almost inconceivable that no longer ago than the turn of the last century, all chain required especially for heavy duty work was turned out by hand. This chain had many good inherent properties some of which are very important in industry today, but the making of it was a heavy, laborious job requiring

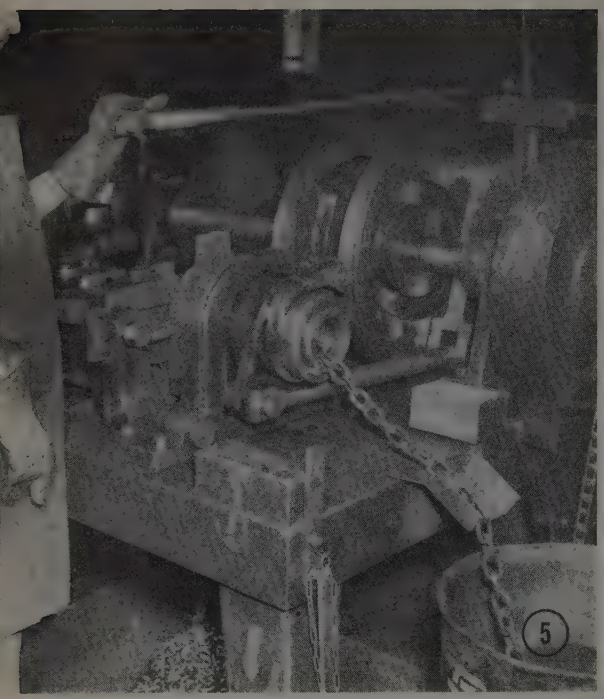


Fig. 5—Cold twisting produces twisted chain from straight links on this equipment. Links are automatically fed through jaws which position work for a cam-operated revolving head which moves through a 90-degree arc in making the twist. In processing approximately 200 pounds of chain per hour, this equipment averages about 30 links per minute, for the various types and sizes

Fig. 6—Before leaving plant, chain is given a thorough testing. A "proof test" reveals load in pounds which chain has withstood when the load has been applied in direct tension to a straight length of chain with a uniform rate of speed represented by a separation of the tester heads not exceeding 10 inches per minute. In addition an "average breaking test" is given which is the load in pounds at which the chain has been found by experience to break, under a test in which the load is applied in direct tension to a straight length of chain with a uniform rate of load represented by a separation of the tester heads not exceeding 10 inches per minute. "Safe working load" test reveals maximum load in pounds that should ever be applied, under any condition, to the chain, when the load is applied in direct tension to a straight length of chain

not only skill but strength and endurance. Everything was done by hand on the anvil.

The chainmaker cut off a piece of the glowing hot rod of material to the desired length for his link of chain. Working the hot metal on his anvil, he formed it into the proper size and shape of link required, and finally completed a neat lap-weld on one end of the link.

Right here is one decided difference in the electrically welded chain made today and the chain made at the forge. Chain is now butt-welded on the side of the links instead of being joined by the lap "weld" formerly employed in all of the old-time chain shops.

The lap-weld is still a part of the hand-forge process of chainmaking today, but the huge volume of chain now made mechanically is all butt-welded.

Butting of the link ends occurs naturally in the link-forming operation. The automatic forming machine takes the wire or rod from a coil, cuts it off squarely to proper length and, shaping the material in the form of a link, butts the ends together closely ready for welding. A high-amperage electrical current is then sent through the butted ends which quickly come to a white heat and fuse together in a perfect weld.

This is welding by electrical resistance and it is accomplished along with mechanical action of dies which exert pressure around the weld to bring the fusing metal back to the original size of the steel wire.

Two machines are involved, in the making of the electric welded chain, the forming machine and the welder, with two operations being involved on the latter. Since every other link in a chain is in a vertical position, and the welder is able to function only on the links that are horizontal, it welds alternate links. The chain is then turned and fed through the welding machine again, this time working on the links that are passed in the first operation.

Chain making has advanced over the past several years not only in the manner in which it is produced, but along other lines in which technical science and metallurgy have revealed valuable data. Much more is known today about the physical characteristics of materials used, how strains and stresses are set up and what may be expected of chain under certain conditions. This knowledge is important in helping the chain manufacturer to be more accurate in inspection, testing, heat-treatment and final recommendation of his product.

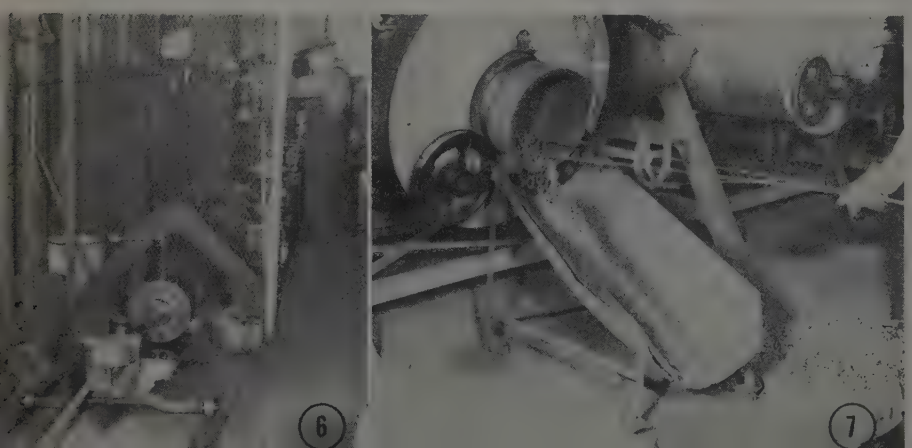


Fig. 7—Load of tire chain being removed from heat-treating furnace. Material slides down chute into water quench tank after being heated approximately 3 hours (for ⅜-inch chain) at 1650-degrees F. Following treatment, chain is inspected visually for links that show signs of weakness or exhibit flaws in welding, forming or twisting

Furnace Brazing

Simplifies Product Design

By H. M. WEBBER
Industrial Heating Division
Apparatus Department
General Electric Co.
Schenectady, N. Y.

Low cost, reduced weight, faster manufacturing cycle are some of the advantages of combining inexpensive stampings, screw-machine parts and tubing into fabricated assemblies by furnace brazing

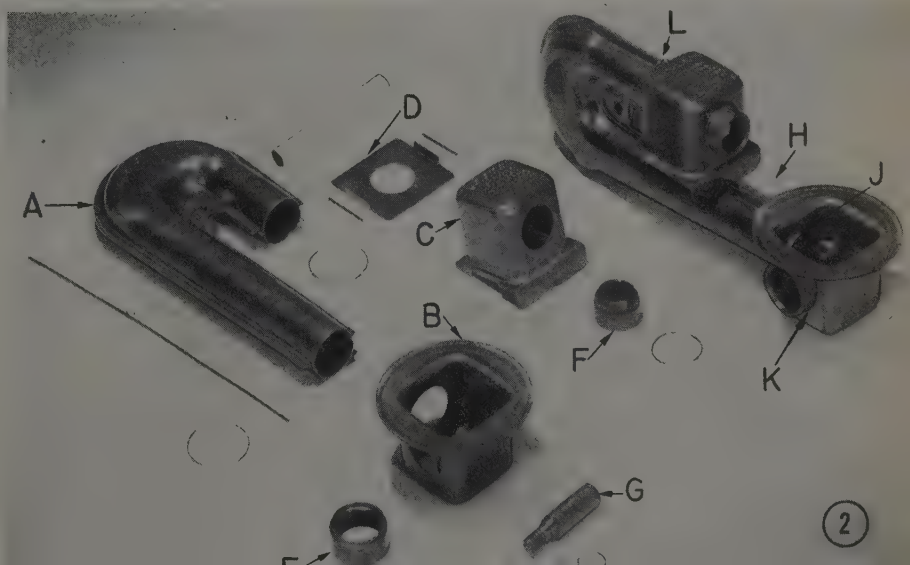
ELECTRIC-furnace brazing has made it possible to simplify product designs, resulting in reduced manufacturing time, savings of materials and lower costs. Numerous parts have been redesigned and are now made from inexpensive stampings, tubing and screw machine parts. Typical examples of such assemblies are parts for gas stoves, automobiles, airplanes and refrigerators.

At Coleman Co., Wichita, Kans., a furnace-brazed burner for camp and trailer stoves has paid attractive dividends. Now made with five stampings and three screw-machine parts, assembled with copper wires preplaced at the joints to serve as brazing metal, the burners are made by modern production-line methods. This fabricated burner has reduced weight 3½-pounds, saving money in both freight and material costs and in addition makes the portable stove easier to carry. No special setups and machining operations are required, other than the inexpensive operations performed on screw-machines, which result in further savings.

Inside dimensions of the burner are more uniform, thus permitting free flow of gas for better operation. Less inventory is involved with the fabricated burner —the flexible construction employing threaded-tube connectors of various lengths for 2 or 3-burner stoves makes it necessary to stock only one supply of burners with a variety of tube connectors, instead of various supplies of cast multiple-type burners. Because of these numerous advantages of furnace brazing, Coleman widened its applications of the process to in-

Fig. 1 — Furnace-brazed stove burners are made of five stampings and three screw-machine parts, assembled with copper wires preplaced at joints to serve as brazing metal

Fig. 2 — Venturi (A) for burner consists of two U-shaped stampings crimped together at edges. Three other stampings (B, C and D) and three screw-machine parts (E, F and G) along with copper wires used for brazing metal are shown in their relative positions. At extreme right (H), parts are assembled with copper wires in position



Furnace Brazing

clude a variety of other burners for water heaters, space heaters, and similar products.

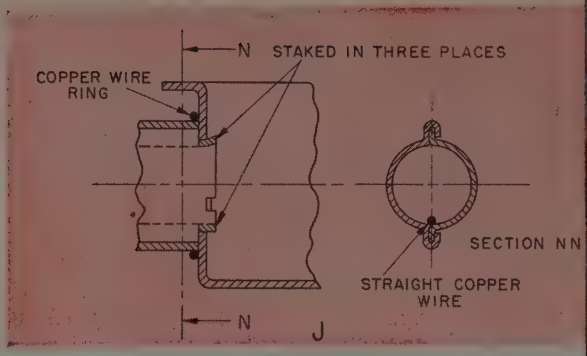
The furnace-brazed burner assembly shown in Fig. 1, plus caps, weighs 1½-pounds and is slightly smaller than its predecessor. The venturi-and-burner unit at the extreme right in Fig. 1 is furnace brazed as one assembly, and the burner unit at the left end of the threaded connector tube is brazed as a separate assembly. This latter unit also has an outlet for an additional connector tube or plug.

Burner Components—Furnace-brazed venturi-and-burner unit is broken down into its components in the left portion of Fig. 2. This illustration also shows these components assembled with the copper wires in place, ready for the assembly to enter the brazing furnace. The component parts and copper wires are laid out in their relative positions prior to assembly. The burner unit consists of a rectangular box (B) having a circular flange, there being two screw-machine parts, a threaded sleeve (E), and a stud (G) pressed in, with copper-wire rings placed around the joints. The venturi (A) shown at the left is made of two stampings with crimped edges. These crimped edges are cut back about ⅛-inch from each end of the assembly so that the tubular sections can be inserted into round holes in the box-like stampings and staked in position. A straight copper wire at the bottom of the venturi, and copper-wire rings around the tubular-insert junction, provide the brazing metal for all of the straight seams and sleeve fits in this portion of the assembly. The copper is drawn by capillary attraction for several inches to complete the bonding of these particular joints.

A flat rectangular stamping (D) closes off the bottom of the rectangular, box-like stamping (C). Crimped edges hold it in place and assure sufficiently good contact for bonding the plate to the box by straight lengths of copper wire which are preplaced along the crimped edges. A knurled fitting (F) is pressed into a hole in the box, the extremity of this fitting being flared to lock it in place. A copper-wire ring around the fitting supplies the brazing metal. The completed assembly (H) at the extreme right, with the brazing wires in place, is ready to enter the furnace.

Locking Joints—Beaded edges of the two stampings lock together to give tight joints, which are essential for best-quality furnace-brazing work. When the straight copper wire in the bottom melts, it flows throughout the bottom joint and is drawn up around the bend until it meets the copper creeping in the opposite direction from the ring at joint L, Fig. 2. Top crimped seam is provided with copper from the wire ring at the sleeve joint J in Fig. 2, and the capillary flow of this copper ultimately joins that supplied by the ring at L.

The method of locking the joints so that the parts will not move in the furnace when they are heated is



illustrated in Fig. 3. Sketch J shows how the tubular portion of the crimped stamping is staked into the box at three points after assembly. Sketch K shows a projection of the screw-machine part slightly flared. Both of these methods are considered good furnace-brazing technique. They are points that can be appreciated by referring to sketch M, Fig. 3, in which there is no locking of the parts which might allow the fitting to drop out when the stamping expands in the heat.

Knurled fitting, Fig. 2, illustrates a method sometimes used to avoid working to extremely close tolerances in order to get press fits. The result gives a compromise type of press fit using relatively wide tolerances which, in some instances, including this one, gives satisfactory results. However, for maximum uniformity in tightness of brazed joints, light sleeve-type press fits are commonly employed when furnace brazing with copper; slight gaps in the joints are generally avoided.

Furnace Specimens—Discharge end of one of the two mesh-belt conveyor-type copper-brazing furnaces at the Coleman Co. plant is shown in Fig. 4. Brazed burner assemblies on the wire-mesh conveyor are shown emerging through asbestos curtains in the discharging opening of the cooling chamber and dropping into a tote box. The furnace illustrated has a belt 12 inches wide, door opening 6 inches high, heating chamber 5 feet long, cooling chamber 15 feet long, electrical rating 45 kilowatts. Rolled-ribbon alloy heating units hold the furnace at about 2060°F, and the protective atmosphere within the heating and cooling chambers, supplied from a separate source, serves the purpose of a flux by reducing oxides on the parts and otherwise cleaning them in preparation for wetting by the molten copper. The atmosphere in the cooling chamber protects the work from oxidation, so that when parts come out into the air they stay clean and bright. Thus, with no cleaning operations required, the assemblies are ready to go along to the next operation.

Furnace atmosphere is supplied by an atmosphere gas converter which partially burns natural gas over a bed of catalyst. The atmosphere gas so produced is inexpensive and highly reducing on low-carbon steel and copper at the operating temperature of 2060°F. Its analysis is about 17 per cent hydrogen, 11 per cent carbon monoxide, five per cent carbon dioxide, two per cent methane, 65 per cent nitrogen, saturated with water vapor at about 70°F. The gas is in-

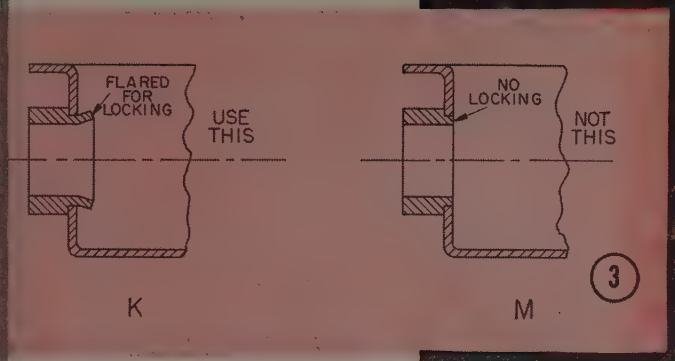
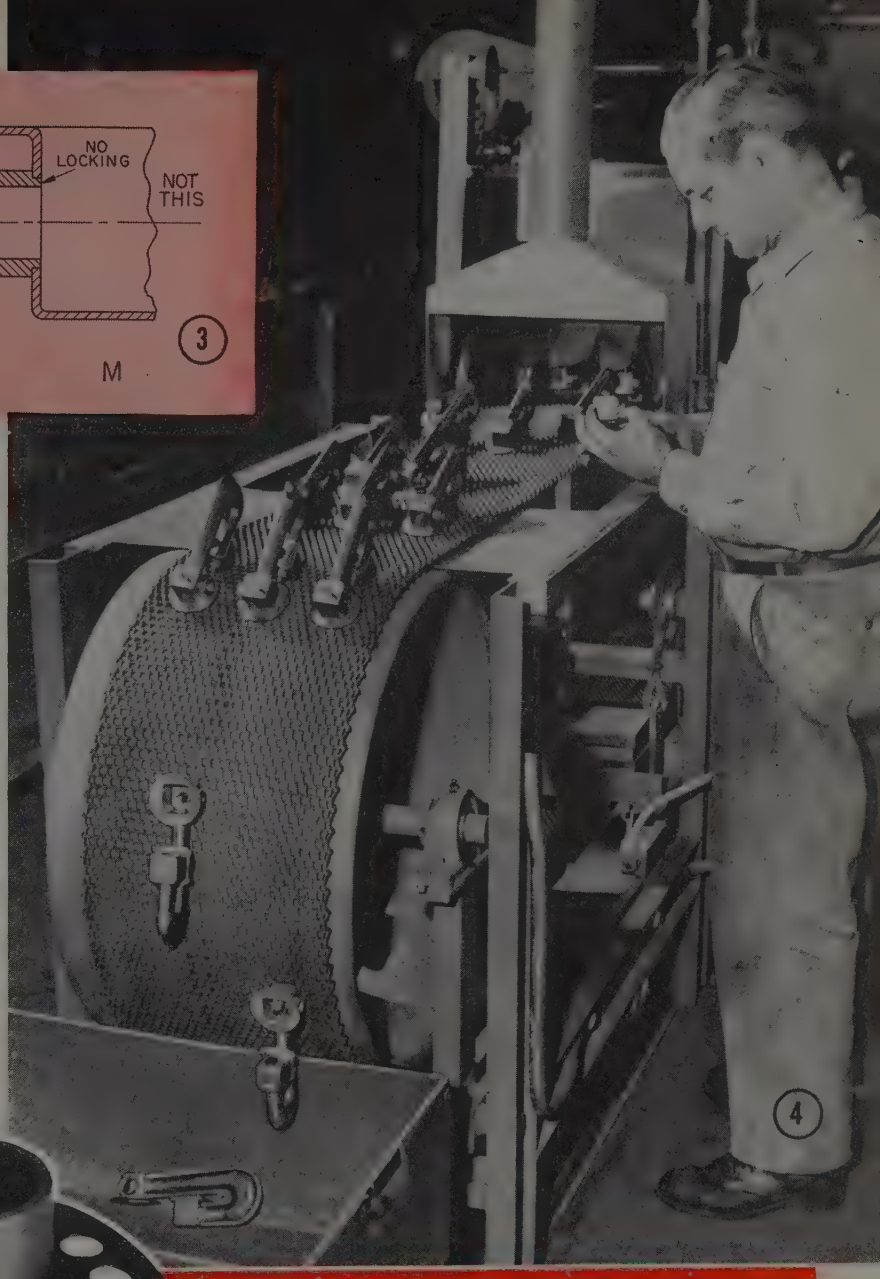


Fig. 3—Left hand view in sketch J shows end of venturi staked in box-like stamping with copper wire ring at joint. Right view at J shows crimped edges of venturi, and straight copper wire in the bottom. Sketch K indicates how screw machine parts are flared to lock them in position so they won't fall out when parts expand in the furnace. Sketch M shows construction to avoid; this lacks locking feature

Fig. 4 — Venturi-and-burner assemblies emerging from cooling chamber of mesh-belt conveyor-type electric furnace

Fig. 5—Breather assembly for fuel-injection pump made of a stamping and screw-machine part from blanks totalling only ½-pound compared to previous weight of 1 pound



flammable and burns at the ends of the furnace, where it is ignited by gas-flame curtains spreading up across the openings to inhibit the flow of infiltrating air.

Breather Assembly—A typical example of an assembly made of inexpensive components is the breather assembly for a fuel-injection pump, Fig. 5, made by American Bosch Corp., Springfield, Mass. An important benefit from converting to electric-furnace brazing is that considerably less material is used. Blanks from which the automatic screw-machine parts and the stampings are formed weigh only about ½-pound, which represents a saving of 50 per cent in material alone. With stepped-up production rate, the investment in equipment is less and the skilled machinists who turn out the hubs on screw machines are more productive. Presses turn out the stamped flanges rapidly and inexpensively. The manufacturing cycle is thus much faster and the over-all cost of the furnace-brazed product is considerably lower.

The flange is now blanked and drawn from 0.020-inch cold-rolled steel strip. It was previously made from 1¾-inch diameter bar stock. The body is turned on screw machines from 1⅛-inch diameter bar stock, this being the diameter of the shoulder at its midpoint. The body is threaded at one end where it is ⅞-inch outside diameter, and it is bored throughout

the entire length. Both flange and body are made of B-1113 steel.

Here, too, good furnace-brazing technique is applied to get best results. The shoulder on the body serves to support the thin stamped flange in position as the asembly passes in vertical position through the copper-brazing furnace. Thus, if the stamped flange should expand while it is heating, it will stay in place where it is desired to be. Also, this stamped flange has an extruded hole which gives a sleeve fit of almost ⅛-inch long on the body. This gives a large bonding area and assures good strength and tightness. Extruded holes such as this are highly recommended for furnace-brazing work.

Copper-wire rings are formed of hard wire slightly smaller in diameter than the body, so that they will be springy and stay in place. The rings are slipped over the assembly above the joint. The assemblies are then set in ribbon-mesh trays, 105 of them being in a tray about 11 inches wide by 32 inches long. The trays are then charged intermittently through a box-type copper-brazing furnace, at a rate of six trays per hour, giving a production of 630 assemblies per hour, all handled by a single furnace operator. The assemblies come from the furnace clean and bright, ready for subsequent operations.

Shock-Absorber Parts—An excellent example of redesigning for furnace brazing is the adapter for automobile shock absorbers shown in Fig. 6. This furnace-brazed assembly is now paying dividends to the Monroe Auto Equipment Co., Monroe, Mich. Redesigning and furnace brazing are the efforts of a jobber in the brazing field, Metal Electric Processing Co., Toledo, O. The bracket is employed to make a standard shock absorber adaptable to service on certain makes of cars.

Furnace brazing was considered to be a good possibility for reducing costs, by using less expensive metal, reducing the weight and eliminating machining operations. The redesign actually resulted in the attainment of all these benefits. Two inexpensive stampings, two pieces of tubing, and a screw-machine part are successfully joined in a single trip through the continuous brazing furnace. A former welding operation has been eliminated, as well as all machining operations, inasmuch as all finishes on the assembly are now satisfactory as obtained on the stampings, tubing, and screw-machine part. Weight has been reduced 32 per cent. As a result, the present assembly has lower over-all cost than its predecessor, and its performance has shown it to be equally as serviceable.

Tubular Spacers — The furnace-brazed adapter weighs only 1 pound 2 ounces, which is somewhat lighter than its predecessor. It is of about the same size. The stamped body of the bracket has a U-section for strength, and is made of black hot-rolled steel 0.113-inch thick. The tubular spacers are 1-inch outside diameter, ⅛-inch wall thickness, and are pressed into holes in the bracket with about 0.003-inch interference fit. The mounting pin is now machined from only ⅝-inch diameter bar stock, and it gets its support through being brazed into a specially-formed recess in the bracket, and to a washer which joins both the pin and the bracket.

In addition to the shape of the part, some interesting fundamentals of good furnace-brazing technique have been employed to help make the job successful. An 0.003-inch interference fit between the tubular spacers and stamping helps maintain high strength. In order properly to locate and hold brazing metal adjacent to the joint, ⅝ rings of 0.040-inch diameter copper are formed and snapped over the top side of the sleeves. At the right end, straight knurling of the mounting pin has been resorted to in order to provide an interference fit.

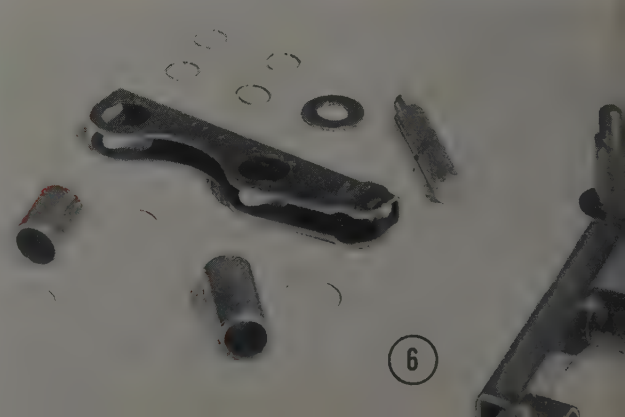
By knurling, the 0.624-inch diameter shaft has been increased to 0.640-inch diameter on the knurled portion. This gives a 0.010-inch interference fit in the 0.630-inch diameter punched holes in the washer and top of the bracket. Because there is a large area to be bonded and it has been found desirable to have a generous supply of copper, four rings of 0.064-inch diameter copper wire are slipped over the top of the mounting pin in preparation for brazing.

Continuous Brazing — The assemblies are brazed continuously in a 12-inch mesh-belt furnace of the same size and rating described above. They are set on the belt in the position shown in Fig. 6, with the pins upright. Combusted gas atmosphere is used, and it is so highly reducing that the iron oxide on the bracket, formed from hot-rolled steel strip, is reduced to iron, and the copper creeps over the surfaces of the stampings in a thin film. This surface capillary action on matte finishes has been observed many times before. In this same connection, it is also interesting to see where thin streaks of copper creep on the tubular spacers, following tiny scratches on the surfaces.

Furnace Brazing

Fig. 6—Adapter for automobile shock absorbers consists of two stampings, two pieces of tubing and a screw-machine part, with copper-wire rings; parts assembled and brazed are shown at right

Fig. 7—Over 1070 joints are copper-brazed in single steel-fin condenser assembly. Component parts are in foreground



Refrigerator Fin Condensers — Solder-dipped fin condensers for refrigeration work have been made for years, but numerous companies have taken advantage of electric-furnace brazing to obtain certain advantages which the process offers. A typical furnace-brazed condenser of this type, made by Kelvinator Division, Nash Kelvinator Corp., Detroit, is shown in Fig. 7.

In this particular case, the original condensers were composed of a formed length of continuous steel tubing, with a uniquely-formed continuous copper fin pressed into place between loops of the tubing. The assemblies were dipped in solder to secure the fins to the tubing and assure uniform and consistent heat transfer. The solder carried out from dipping was an expensive item of material, and cleaning to remove flux after soldering required extra labor. Inserting and removing plugs at the ends of tubes before and after dipping took time. As a result, the over-all cost was relatively high.

When conversion was made to the furnace-brazed fin condenser, steel instead of copper fins were adopted, although this change could have been made before when using the solder-dipping process. Bundyweld copper-brazed steel tubing was also adopted, but it, too, would be suitable for the former method. However, in this case, the Bundyweld tubing carries enough copper on its surface to efficiently bond the fins to the tubing. The only brazing metal added is a small amount at the ends to join return bends onto the tubes. Thus, the saving in eliminating the solder carry-out has been an appreciable item. Also, all cleaning operations have been eliminated because the condensers come from the furnaces free from flux or oxide deposits. Dipping-plugs for soldering have also been eliminated. As a result, the condensers are made with uniformly high quality and lower overall costs.

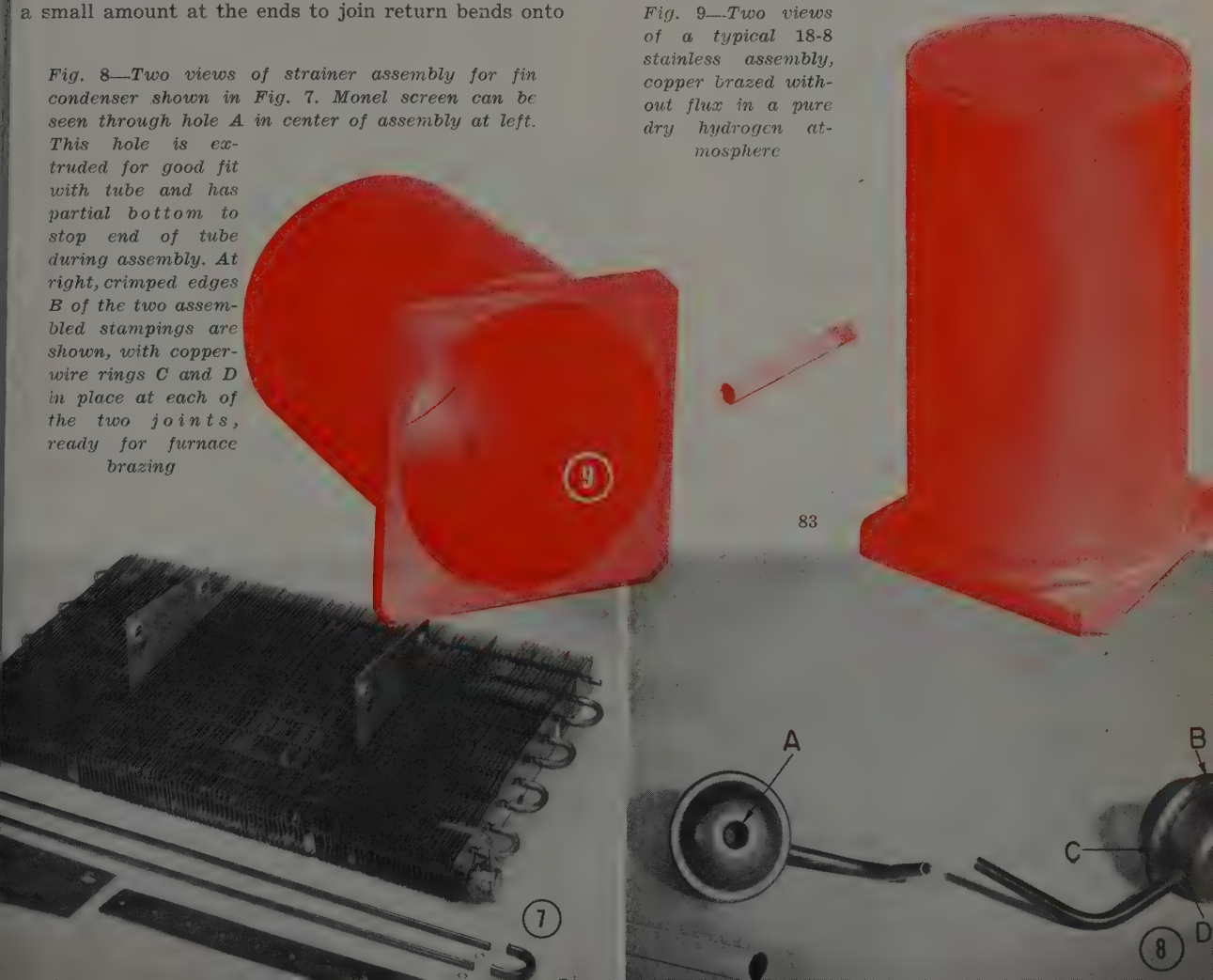
The condenser shown in Fig. 7 is made up of a number of components, which are also illustrated. The 106 fins, 1¾-inches by 13 inches by 0.010-inch are sheared from coiled strip, ten holes are punched and extruded, the corners are cut off, and the fins are slightly crimped, all at the rate of 400 fins per minute from a superspeed press.

There are also two mounting brackets as shown, with extruded holes. And there are five long U-shaped pieces of ¼-inch outside diameter Bundyweld tubing, four return bends made of the same tubing, and a strainer assembly. Fins and brackets are stacked in a jig to line up the holes, and hardened leaders of tapered steel are inserted in the ends of the long hairpin tubes. The hairpins are then forced by a hydraulic press into the nest of fins, copper-wire rings placed over the ends of the tubes, and the return bends and strainer pressed on.

A copper paste made of copper powder, clear lacquer, and thinner is then daubed at the joints

Fig. 8—Two views of strainer assembly for fin condenser shown in Fig. 7. Monel screen can be seen through hole A in center of assembly at left. This hole is extruded for good fit with tube and has partial bottom to stop end of tube during assembly. At right, crimped edges B of the two assembled stampings are shown, with copper-wire rings C and D in place at each of the two joints, ready for furnace brazing

Fig. 9—Two views of a typical 18-8 stainless assembly, copper brazed without flux in a pure dry hydrogen atmosphere



where return bends and strainer are attached to assist wetting. No copper is added to bond the fins to the tubes other than that carried on the Bundyweld tubing. More than 1070 joints are brazed in this single assembly.

Extruded Holes—Strainer assembly shown in closeup in Fig. 8 is rather interesting from the brazing standpoint. It is made from two steel stampings and a Monel screen, the screen being locked between crimped edges of the stampings. In addition to the crimped edges, (B in Fig. 8), which are highly approved for furnace-brazing work, there are two extruded holes, one (D) in the side of one of the stampings and one (A) in the end of the other. Here again, the extruded holes give sleeve fits and make much better construction than if the tubing were pressed into only punched holes. One of these extruded holes, the one marked "A" in the end of the cap, is bottomed slightly to serve as a stop for the tube inserted into it. Copper-wire rings C and D preplaced at the joints as shown provide a reliably uniform amount of brazing metal.

The fin condensers are loaded on light-weight fabricated trays, two condensers in the width and two in the height, with suitable spacers between decks, and then are passed through roller-hearth conveyor-type copper-brazing furnaces. Trayloads are automatically charged and discharged, and there is a continuous flow of the material through the heating and cooling chambers. Each of the three furnaces in the Kelvinator plant is rated 320 kilowatts, having a door opening 29 inches wide by 13 inches high, heating chamber 17 feet long, and a cooling chamber 60 feet long.

Return conveyors carry the trayloads of work back to the charging end, where the trays are unloaded and reloaded. The roller-hearth furnace is widely used in the copper brazing of fin condensers because it is ideally suited for large-scale production such as is encountered in refrigerator manufacturing plants. In the Kelvinator plant, however, the fin condenser is only one of several types of assemblies being furnace brazed. Among others are domes for the hermetic units, muffler-and-head assemblies, receivers and filters. In all of this work, the main reasons for employing furnace brazing are: Clean, dry surfaces on the assemblies, uniform tightness of bonds accompanied by high strength, and low cost.

Stainless-Steel Brazing—Something relatively new in the way of furnace

(*Please turn to Page* 114)

Cutting Tool and Die Materials

LAST OF A
SEVEN SECTION SERIES

This information on cutting tool and die materials prepared by the editors of STEEL lists factors to be considered in the quick selection of tool steels and carbide types to meet any given requirement. Sources, trade names and applications are conveniently presented. Other pertinent data include chemical analyses, heat treatments, quenching media, movement in hardening and machinability as annealed

Previous data on tool and die materials appeared in the following issues: p. 98, Aug. 16, 1948; p. 82, Aug. 23, 1948; p. 64, Aug. 30, 1948; p. 96, Sept. 6, 1948; p. 106, Sept. 13, 1948; p. 92, Sept. 27, 1948

UNIVERSAL-CYCLOPS STEEL CORP., Station St., Bridgeville, Pa. and Titusville, Pa.

Listing No. 48

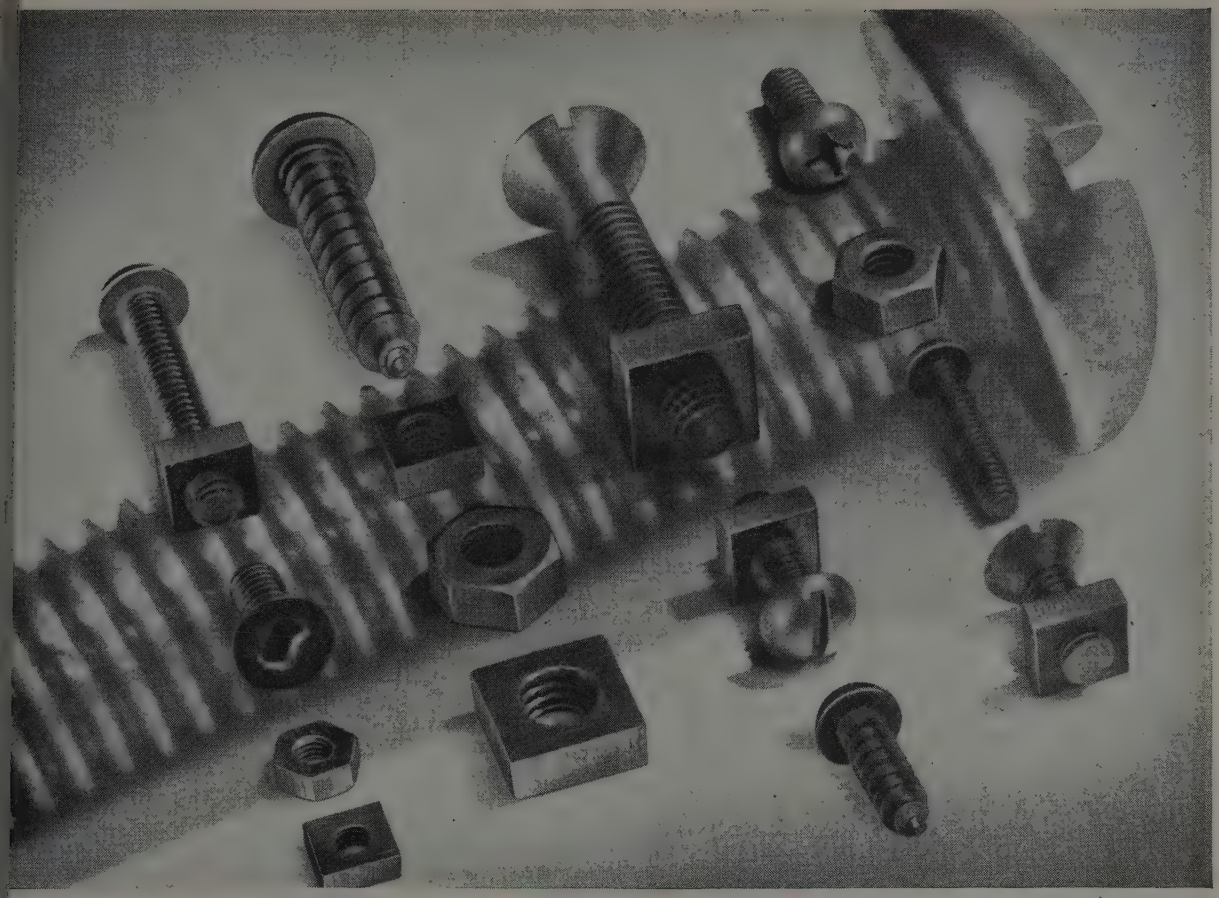
PRIMARY APPLICATION	TRADE NAME & TYPE	ANALYSIS (%)	SUGGESTED TEMPERATURE RANGES (°F)						Quenching Medium. ★ % Machinability Annealed. Movement in Hardening.
			Forging	Finish Forging	Annealing	Preheating	Hardening	Tempering	
Cold Work Dies (Blanking, Forming)	CYCLOPS SPECIAL Water Hardening	C 1.00, Mn .25, Si .25	1700	1500	1400	1200	1425	400	Water Mach. 100 Movement +C
Cold Work Dies (Blanking, Forming)	EK-81 Air Hardening	C 1.35, Mn .25, Cr 12.75, Mo .80, Co 3.00, Si .25	1850	1650	1650	1200	1800	400	Air Mach. 185 Movement +A
Cold Work Dies (Blanking, Forming)	SPARTA Air Hardening	C 1.00, Mn .65, Cr 5.25, Mo 1.10, V .25, Si .30	1950	1725	1575	1200	1775	400	Air Mach. 135 Movement +A
Cold Work Dies (Blanking, Forming)	SPARTA 80 Air Hardening	C .80, Mn .65, Cr 5.25, Mo 1.10, V .25, Si .30	1950	1725	1575	1200	1775	400	Air Mach. 130 Movement +A
Cold Work Dies (Blanking, Forming)	ULTRADIE # 1 Air Hardening	C 2.25, Mn .25, Cr 12.00, Mo .80, V .20, Si .25	1850	1650	1650	1200	1800	400	Air Mach. 200 Movement +A
Cold Work Dies (Blanking, Forming)	ULTRADIE #2 Air Hardening	C 1.50, Mn .25, Cr 12.00, Mo .80, V .25, Si .25	1850	1650	1650	1200	1800	400	Air Mach. 185 Movement +A
Cold Work Dies (Blanking, Forming)	WANDO Oil Hardening	C .90, Mn 1.20, Cr .50, W .50, V .20, Si .25	1850	1550	1450	1200	1475	400	Oil Mach. 110 Movement +B
Cutting Tools (Finishing)	B-9 High Speed	C .84, Mn .30, Cr 4.25, W 18.50, Mo .50, V 2.00, Si .35	2100	1700	1650	1550	2350	1050	Oil Mach. 130 Movement +B
Cutting Tools (Finishing)	MOTUNG High Speed	C .80, Mn .30, Cr 4.00, W 1.50, Mo 8.50, V 1.15, Si .35	2000	1700	1550	1450	2200	1025	Oil Mach. 125 Movement +B
Cutting Tools (Finishing)	MOTUNG 652 High Speed	C .82, Mn .30, Cr 4.00, W 6.50, Mo 5.00, V 1.90, Si .35	2150	1700	1550	1450	2250	1050	Oil Mach. 130 Movement +B
Cutting Tools (Finishing)	MOVAN High Speed	C .85, Mn .30, Cr 4.00, Mo 8.50, V 2.10, Si .35	2000	1700	1550	1450	2200	1025	Oil Mach. 125 Movement +B
Cutting Tools (Finishing)	UNIBROACH High Speed	C .80, Mn .30, Cr 4.00, W 6.25, Mo 6.25, V 2.40, Si .35	2000	1700	1550	1450	2225	1050	Oil Mach. 135 Movement +B
Cutting Tools (Roughing)	B-6 High Speed	C .75, Mn .30, Cr 4.00, W 18.00, V 1.10, Si .35	2050	1700	1650	1550	2350	1050	Oil Mach. 130 Movement +B
Cutting Tools (Roughing)	B-7 High Speed	C .75, Mn .30, Cr 4.25, W 18.00, Mo .50, V 1.10, Co 5.00, Si .35	2100	1750	1650	1550	2375	1100	Oil Mach. 130 Movement +B
Cutting Tools (Roughing)	B-8 High Speed	C .78, Mn .30, Cr 4.25, W 14.00, Mo .50, V 2.25, Co 5.00, Si .35	2100	1750	1650	1550	2350	1050	Oil Mach. 130 Movement +B
Cutting Tools (Roughing)	B-10 High Speed	C .80, Mn .30, Cr 4.50, W 18.50, Mo 1.00, V 2.00, Co 9.00, Si .35	2100	1750	1650	1550	2400	1100	Oil Mach. 135 Movement +B
Cutting Tools (Roughing)	SUPER MOTUNG High Speed	C .82, Mn .30, Cr 4.00, W 1.50, Mo 8.50, V 1.25, Co 5.00, Si .35	2000	1700	1550	1450	2250	1050	Oil Mach. 125 Movement +B
Die Casting Dies (Aluminum, Magnesium)	KS Air Hardening	C .35, Mn .40, Cr 5.25, W 5.25, Mo .25, Si 1.00	1900	1675	1575	1500	1950	1150	Air Mach. 125 Movement +A
Die Casting Dies (Aluminum, Magnesium)	THERMOLD A Air Hardening	C .35, Mn .45, Cr 5.00, Mo 1.35, V .40, Si 1.00	1950	1600	1500	1200	1825	1125	Air Mach. 120 Movement +A
Die Casting Dies (Aluminum, Magnesium)	THERMOLD AV Air Hardening	C .37, Mn .45, Cr 5.00, Mo 1.35, V 1.00, Si 1.00	1950	1600	1500	1200	1825	1125	Air Mach. 120 Movement +A
Die Casting Dies (Aluminum, Magnesium)	THERMOLD B Air Hardening	C .35, Mn .30, Cr 5.00, W 1.35, Mo 1.75, Si 1.00	1950	1600	1500	1200	1825	1100	Air Mach. 120 Movement +A
Die Casting Dies	ALCO S Oil Hardening	C .50, Mn .30, Cr 1.75, W 2.25, Mo .50, V .20, Si 1.10	1950	1600	1450	1200	1750	350	Oil Mach. 120 Movement +B
Die Casting Dies	CYCLOPS EXTRA Water Hardening	C 1.00, Mn .30, Si .25	1700	1500	1400	1200	1425	500	Water Mach. 100 Movement +C
Die Casting Dies	VENANGO Oil Hardening	C .50, Mn .45, Mo .50, V .20, Si 1.10	1850	1600	1500	1200	1650	300	Oil Mach. 115 Movement +B
Die Casting Dies (Zinc)	ORION Oil Hardening	C .50, Mn .60, Cr 1.00, V .20, Si .30	1850	1600	1425	1200	1600	800	Oil Mach. 85 Movement +B
Hot Work Dies	ALCO M Oil Hardening	C .45, Mn .30, Cr 1.50, W 2.25, Mo .50, V .25, Si .35	1950	1600	1450	1200	1750	1100	Oil Mach. 120 Movement +B
Hot Work Dies	KL Oil Hardening	C .35, Mn .60, Cr 7.50, W 7.50, Si 1.50	2050	1700	1625	1525	2150	1200	Oil Mach. 125 Movement +B
Hot Work Dies	KM Oil Hardening	C .45, Mn .60, Cr 7.50, W 7.50, Si 1.50	2050	1700	1625	1525	2150	1200	Oil Mach. 125 Movement +B
Hot Work Dies	(See ALCO S, KS, THERMOLD A, THERMOLD B, Listed Above)								
Hot Work Dies (Hot Punching, Shearing, Forming)	B44 Oil Hardening	C .35, Mn .25, Cr 3.50, W 11.00, V .45, Si .20	1900	1625	1550	1500	2100	1200	Oil Mach. 125 Movement +B

PRIMARY APPLICATION	TRADE NAME & TYPE	ANALYSIS (%)	SUGGESTED TEMPERATURE RANGES (°F)						Quenching Medium. ★ % Machinability Annealed. Movement in Hardening.
			Forging	Finish Forging	Annealing	Preheating	Hardening	Tempering	
Hot Work Dies	B44J	C .30, Mn .30, Cr 3.25, W 9.50,	1900	1625	1550	1500	2100	1175	Oil Mach. 125
(Hot Punching, Shearing, Forming)	Oil Hardening	V .30, Si .30	....	....	....	....	....	....	Movement +B
Hot Work Dies	B4	C .45, Mn .25, Cr 3.50, W 13.25,	1950	1625	1600	1500	2150	1275	Oil Mach. 125
(Hot Punching, Shearing, Forming)	Oil Hardening	Si .20	....	....	....	....	....	....	Movement +B
Hot Work Dies	B6X	C .50, Mn .25, Cr 4.00, W 18.00,	2050	1700	1650	1550	2350	1050	Oil Mach. 125,
(Hot Punching, Shearing, Forming)	High Speed	V 1.00, Si .30	....	....	....	....	....	....	Movement +B, +C 85
Plastic Molding Dies (Ejector Pins)	(See ALCO S, CYCLOPS EXTRA, VENANGO, Listed Above)								
Plastic Molding Dies (Hubs)	(See ALCO S, SPARTA, SPARTA 80, ULTRADIE #2, VENANGO, Listed Above)								
Plastic Molding Dies	UNILOY 1435	C .40, Mn .40, Cr 13.00, Si .30	2000	1700	1550	1200	1825	400	Oil Mach. 150
(Machine Cut Cavities)	Oil Hardening		....	....	....	....	....	....	Movement +B
Plastic Molding Dies	UNILOY 1860	C .60, Mn .40, Cr 17.00, Si .30	2100	1750	1650	1400	1875	400	Oil Mach. 175
(Machine Cut Cavities)	Oil Hardening		....	....	....	....	....	....	Movement +B
Plastic Molding Dies	WANDO	(Listed Above)							
(Machine Cut Cavities)									
Plastic Molding Dies	(See SPARTA, THERMOLD A, THERMOLD B, Listed Above)								
(Machine Cut Cavities)									
Punching and Shearing	CYCLOPS 67	C .55, Mn .75, V .20, Si 2.00	1850	1600	1500	1200	1600	350	Water, Oil Mach. 115
	Water, Oil Hardening		....	....	....	....	....	....	Movement +C, +B
Punching and Shearing	DRACO	C 1.00, Mn .30, V .20	1700	1600	1400	1200	1425	400	Water Mach. 100
	Water Hardening		....	....	....	....	....	....	Movement +C
Punching and Shearing	(See ALCO M, ALCO S, CYCLOPS SPECIAL, EK-81, ORION, SPARTA, SPARTA 80, ULTRADIE #2, VENANGO, WANDO, Listed Above)								
Shock Resisting (Intermittent Impact)	ORION	(Listed Above)							
Shock Resisting (Repeated Impact)	(See ALCO M, ALCO S, CYCLOPS 67, VENANGO, Listed Above)								

VANADIUM-ALLOYS STEEL CO., Latrobe, Pa.

Listing No. 49

Cold Work Dies	AIR HARD	C 1.00, Mn .70, Cr 5.25, Mo 1.10,	1950	1650	1550	1450	1750	350–	Air Mach. 85
	Air Hardening	V .25, Si .30	....	....	....	....	....	1000	Movement A
Cold Work Dies	COLHED	C 1.00, Mn .20, V .45, Si .25	1850	1550	1425	....	1600	300–	Water Mach. 100
	Water Hardening		....	....	....	....	....	700	Movement C
Cold Work Dies	COLONIAL No. 6	C .95, Mn 1.20, Cr .50, W .50, V .20,	1700	1500	1425–	1250	1450	275–	Oil Mach. 90
	Oil Hardening	Si .30	....	....	1450	....	....	400	Movement A
Cold Work Dies	CROCAR	C 2.20, Mn .20, Cr 12.00, V .80,	1950	1650	1625	1450	1775	500–	Oil Mach. 40
	Oil Hardening	Co .50, Si .30	....	....	....	....	....	1000	Movement A
Cold Work Dies	NIKRO M	C .70, Mn .55, Cr .85, Mo .25, Si .30,	1900	1550	1450	....	1475	350–	Oil Mach. 75
	Oil Hardening	Ni 1.40	....	....	....	....	....	1000	Movement A
Cold Work Dies	OHIO DIE	C 1.55, Mn .25, Cr 12.00, Mo .80,	1900	1600	1625	1450	1875	300–	Air Mach. 45
	Air Hardening	V .80, Co .40, Si .38	....	....	....	....	....	1000	Movement A
Cold Work Dies	RED STAR TUNGSTEN	C 1.20, Mn .25, Cr .70, W 1.60,	1850	1600	1475	....	1600	300–	Oil Mach. 85
	Water, Oil Hardening	Mo .25, V .20, Si .30	....	....	....	....	....	1000	Movement A
Cutting Tools	CM	C 1.25, Mn .60, Cr .50, Si .25	1700	1550	1450	....	1525	300–	Oil Mach. 90
(Carbon)	Water, Oil Hardening		....	....	....	....	....	1000	Movement A
Cutting Tools	COLONIAL No. 7	C Opt., Mn .20, V .20, Si .25	1900	1450	1450	....	1425–	100–	Water Mach. 100
(Carbon)	Water Hardening		....	....	....	....	1500	350	Movement C
Cutting Tools	COLONIAL No. 14	C Opt., Mn .25, Si .25	1900	1450	1450	....	1425–	100–	Water Mach. 100
(Carbon)	Water Hardening		....	....	....	....	1500	350	Movement C
Cutting Tools	CROMAN	C 1.20, Mn .85, Cr .50, Mo .60, Si .25	1700	1550	1450	....	1525	300–	Oil Mach. 90
(Carbon)	Water, Oil Hardening		....	....	....	....	....	1000	Movement A
Cutting Tools	GRAY CUT COBALT	C .80, Mn .25, Cr 4.25, W 20.50,	2100	1800	1675	1550	2350	1000–	Oil Mach. 40
(Roughing)	Oil, Air Hardening, High Speed	Mo .60, V 1.60, Co 12.25, Si .30	....	....	....	....	....	1200	Movement A
Cutting Tools	RED CUT COBALT	C .73, Mn .20, Cr 4.25, W 18.25,	2050	1800	1625	1550	2370	1000–	Oil Mach. 50
(Roughing)	Oil, Air Hardening, High Speed	Mo .65, V 1.08, Co 4.75, Si .30	....	....	....	....	....	1100	Movement A
Cutting Tools	RED CUT COBALT B	C .78, Mn .25, Cr 4.25, W 18.50,	2100	1800	1675	1550	2350	1000–	Oil Mach. 45
(Roughing)	Oil, Air Hardening, High Speed	Mo .75, V 1.85, Co 8.75, Si .30	....	....	....	....	....	1050	Movement A
Cutting Tools	VASCO SUPREME	C 1.50, Mn .25, Cr 4.75, W 12.50,	2100	1700	1625	1500	2270	1000–	Oil Mach. 45
(Roughing)	Oil, Air Hardening, High Speed	V 5.00, Co 5.00, Si .25	....	....	....	....	....	1100	Movement A
Cutting Tools	E.V.M.	C .85, Mn .25, Cr 4.25, W 18.10,	2100	1800	1625	1550	2350	900–	Oil Mach. 45
(Roughing, Finishing)	Oil, Air Hardening, High Speed	V 2.00, Si .35	....	....	....	....	....	1100	Movement A
Cutting Tools	NEATRO	C 1.27, Mn .25, Cr 4.50, W 5.50,	2050	1700	1600	1450	2225	900–	Oil Mach. 45
(Roughing, Finishing)	Oil Hardening, High Speed	Mo 4.50, V 4.00, Si .30	....	....	....	....	....	1200	Movement A



IT'S "t.f.e." TO CUT THE MAJOR COSTS OF FASTENING

The *major* costs are time and labor. A *minor* cost is initial price.

When you give a man a fastener he can handle with confidence and ease . . . because the dimensions are accurate and uniform, the threads sharp and clean, the heads strong . . . you are saving money. Far more money than you could save through a lower price.

Each time your worker picks up an RB&W bolt, nut, screw or rivet . . . you benefit, cost-wise, from RB&W's know-how, acquired through 103 years of pioneering . . . and from the tremendous investments RB&W has made in modern plants, modern machinery, modern quality control practices.

WORKERS LIKE dependable fasteners headed, threaded and finished to RB&W's quality standards which insure accurate, uniform dimensions; clean, smooth surfaces.

ASSEMBLY SPEED depends on fastener accuracy, obtainable only by controlling raw material. RB&W draws its own wire, using tungsten carbide dies for closest tolerances.

QUALITY CONTROL, with RB&W, is built around proper preparation of materials and equipment. Our constant check, plus conscientious inspection, reduces *your* inspection.

t.f.e.

TRUE FASTENER ECONOMY IS THE LOWEST TOTAL OF ALL FASTENING COSTS

RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

Plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at: Philadelphia, Detroit, Chicago, Chattanooga, Oakland, Portland, Seattle. Distributors from coast to coast.

103 Years Making Strong the Things That Make America Strong

PRIMARY APPLICATION	TRADE NAME & TYPE	ANALYSIS (%)	SUGGESTED TEMPERATURE RANGES (°F)						Quenching Medium. ★ % Machinability Annealed. Movement in Hardening.
			Forging	Finish Forging	Annealing	Preheating	Hardening	Tempering	
Cutting Tools (Roughing, Finishing)	RED CUT SUPERIOR Oil, Air Hardening, High Speed	C .72, Mn .20, Cr 4.00, W 18.00, V 1.00, Si .30	2050	1700	1625	1550	2350	900–1200	Oil Mach. 55 Movement A
Cutting Tools (Roughing, Finishing)	VAN-LOM Oil Hardening, High Speed	C .87, Mn .20, Cr 4.00, Mo 8.25, V 1.95, Si .30	1950	1700	1550	1450	2225	800–1200	Oil Mach. 60 Movement A
Cutting Tools (Roughing, Finishing)	VASCO M-2 Oil, Air Hardening, High Speed	C .83, Mn .25, Cr 4.20, W 6.35, Mo 5.00, V 1.90, Si .30	2050	1700	1575	1450	2225	1000–1150	Oil Mach. 55 Movement A
Cutting Tools (Roughing, Finishing)	8-N-2 Oil Hardening, High Speed	C .79, Mn .20, Cr 3.75, W 1.50, Mo 8.60, V 1.10, Si .25	1950	1700	1550	1450	2180	800–1200	Oil Mach. 60 Movement A
Hot Work Dies	FORGE-DIE Oil Hardening	C .26, Mn .25, Cr 3.50, W 14.00, V .50, Si .25	2150	1700	1650	1550	2225	1050–1300	Oil Mach. 55 Movement A
Hot Work Dies	HOTFORM Air Hardening	C .35, Mn .30, Cr 5.00, W Opt., Mo 1.40, V .45, Si .90	2100	1600	1525	1450	1850	900–1100	Air Mach. 75 Movement A
Hot Work Dies	HOTFORM No. 3 Air Hardening	C .52, Mn .30, Cr 4.75, W 1.20, Mo 1.40, Si .90	2100	1600	1525	1425	1800	900–1100	Air Mach. 75 Movement A
Hot Work Dies	HOTPRESS Oil Hardening	C .35, Mn .25, Cr 2.00, W 9.25, V .50, Si .25	2200	1600	1600	1525	2100	1000–1300	Oil Mach. 60 Movement A
Hot Work Dies	MARVEL Oil Hardening	C .33, Mn .20, Cr 3.50, W 9.75, V .50, Si .30	2200	1650	1625	1525	2100	1000–1300	Oil Mach.60 Movement A
Hot Work Dies	RED CUT SUPERIOR J Oil Hardening	C .52, Mn .20, Cr 4.00, W 18.00, V 1.00, Si .32	2100	1700	1625	1550	2350	900–1200	Oil Mach. 55 Movement A
Hot Work Dies	SC SPECIAL Oil Hardening	C .47, Mn .30, Cr 2.75, W 14.00, V .50, Si .30	2050	1700	1625	1550	2100	1050–1350	Oil Mach. 55 Movement A
Hot Work Dies	W.W. HOT WORK Oil Hardening	C .32, Mn .35, Cr 12.00, W 12.00, V 1.05, Si .50	2050	1700	1650	1550	2300	1200–1500	Oil Mach. 55 Movement A
Plastic Mold Dies	SPEED-CUT Oil, Air Hardening	C .43, Mn .85, Cr 1.12, Mo .50, Si .30	2050	1600	1500	....	1575	300–1200	Oil Mach. 140 Movement A
Special Steels (Shock Resisting)	MOSIL Oil Hardening	C .57, Mn .85, Cr .25, Mo .33, Si 1.90	2050	1600	1475	....	1625	300–1300	Oil Mach. 85 Movement B
Special Steels (Shock Resisting)	PAR-EXC Oil Hardening	C .50, Mn .20, Cr 1.65, W 2.00, V .25, Si .25	1900	1650	1500	....	1625	500–1300	Oil Mach. 80 Movement A
Special Steels (Shock Resisting)	SILMAN Water, Oil Hardening	C .55, Mn .85, Cr .25, V .20, Si 2.00	2000 ...	1600 ...	1475	....	1600	400–500	Water Mach. 85 Movement C

VASCOLOY RAMET CORP., 2200 Sheridan Rd., North Chicago, Ill.

Listing No. 50

Cutting Tools (Corrosion, Abrasion Resistant Alloys, Roughing)	AW, Carbide
Cutting Tools (Steel Finishing)	E, Carbide
Cutting Tools (Steel Roughing)	EE, Carbide
Cutting Tools (Steel, Finishing & Precision Boring)	E-H, Carbide
Cutting Tools (Steel, General Purpose)	EM, Carbide
Cutting Tools (General Purpose)	TANTUNG G Cast (Cobalt-Chromium-Tungsten Alloy)
Cutting Tools (For more Abrasive Materials)	TANTUNG G-2 Cast Alloy
Cutting Tools (Steel & Steel Castings, Shock Resisting at low & Medium Speeds)	XX, Carbide
Cutting Tools (Cast Iron & Nonferrous, Shock Resisting)	2A3, Carbide
Cutting Tools (Cast Iron & Nonferrous, Finishing)	2A5, Carbide
Cutting Tools (Cast Iron & Nonferrous Finishing)	2A7, Carbide
Cutting Tools (Cast Iron and Nonferrous Finishing, More shock resisting than 2A7)	2A8, Carbide
Cutting Tools (Cast Iron & Nonferrous, General Purpose)	2A68, Carbide

★ Last column indicates suggested Quenching Medium; Machinability Annealed using base 100 for carbon and low alloy steels; and Movement in Hardening by "A" for slight, "B" for intermediate, "C" for considerable movement—"+" denotes expansion, "—" denotes contraction.

GETTING HEAVY PROCESS EQUIPMENT THROUGH THE EYE OF A NEEDLE

Building steel plate fabricated equipment is only part of our job. Transporting that equipment to the customer's site often involves ingenious planning and meticulous attention to the details of loading.

Routing these bulky shipments through the varying clearance limitations imposed by the different railroads is, in many respects, like threading a needle. "Know how" makes the job easier and quicker.

The General American Plate & Welding Division Plant located at Sharon, Pa., has direct access to a number of heavy duty freight carriers. One of these railroads has the widest clearances of any road in the United States.

General American's "know how" in the transportation field is born of long years of experience in the operation of the largest fleet of privately owned tank cars in the world.

When you call on General American, you know you'll have a smooth running job from the preliminary planning stage to the day your new equipment is ready to operate.

OTHER GENERAL AMERICAN EQUIPMENT

Annealing Covers
Bases—Welded
Bins
Charging Boxes
Pressure Vessels
Steel Stacks
Accumulator Tanks—High Pressure
Large Diameter Pipe and Mains
Pots—Tin or Galvanizing
Weldments
Steel and Alloy Plate Fabrication
Storage Tanks
oil—water—acid—propane—butane
Wiggins Conservation Structures

GENERAL AMERICAN TRANSPORTATION CORPORATION

Plate & Welding Division

SALES OFFICE: 10 East 49th St., Dept. 910 , New York 17, N. Y.

WORKS: Sharon, Pa., East Chicago, Ind.

OFFICES: Chicago, Cleveland, Louisville, Orlando, Pittsburgh, St. Louis, Salt Lake City, Sharon, Washington, D. C.

PLATE & WELDING DIVISION GENERAL AMERICAN TRADE MARK

PRIMARY APPLICATION	TRADE NAME & TYPE	ANALYSIS (%)	SUGGESTED TEMPERATURE RANGES (°F)						Quenching Medium. ★ % Machinability Annealed. Movement in Hardening.
			Forging	Finish Forging	Annealing	Preheating	Hardening	Tempering	
VULCAN CRUCIBLE STEEL CO., No. 1 Main St., W. Aliquippa, Pa.									**Listing No. 51**
Cold Work Dies	FORT PITT Water Hardening	C .70-1.00, Mn .30	1800– 2100	1600	1400– 1450	1250	1400– 1550	300– 700	Water Movement C
Cold Work Dies (Blanking)	SPECIAL VANADIUM Water Hardening	C .80-1.15, Mn .30, V .30	1800– 2100	1550	1425	1250	1400– 1550	350– 650	Water Movement C
Cold Work Dies (Drawing)	REGAL Water Hardening	C 1.35, W 3.50	1800– 2000	1700	1600	1250	1450– 1550	300– 350	Water Movement C
Cold Work Dies (Forming)	K.R. Water Hardening		1800– 2100	1650	1450	1250	1450– 1500	300– 600	Water Movement C
Cold Work Dies (Blanking, Forming)	ALIDIE Oil, Air Hardening	C 1.55, Cr 12.00, Mo .75, V .25	1900– 2050	1800	1600	1350	1750– 1850	400– 900	Oil, Air Movement A
Cold Work Dies (Blanking, Forming)	EXTRA Water Hardening	C .80-1.20, Mn .30	1800– 2100	1600	1400– 1450	1250	1400– 1550	300– 700	Water Movement C
Cold Work Dies (Blanking, Forming)	HARDRITE Oil Hardening	C 1.10, Cr .60, W 1.75, V .25	1900– 2100	1600	1450	1250	1570– 1650	300– 600	Oil Movement A
Cold Work Dies (Blanking, Forming)	NON-SHRINK Oil Hardening	C .90, Mn 1.50, Cr .20	1800– 2100	1600	1400	1250	1400– 1475	300– 600	Oil Movement A
Cold Work Dies (Blanking, Forming)	OIL HARDENING Oil Hardening	C .90, Mn 1.20, Cr .50, W .50	1800– 2100	1650	1425	1250	1425– 1500	300– 600	Oil Movement A
Cold Work Dies (Blanking, Forming)	SPECIAL Water Hardening	C .80-1.40, Mn .30	1800– 2100	1600	1400– 1450	1250	1400– 1550	300– 700	Water Movement C
Cold Work Dies (Blanking, Forming)	VAIRLOY Air Hardening	C 1.00, Mn 2.00, Cr .90, Mo .90	1900– 2100	1800	1400	1250	1500– 1600	400– 800	Air Movement A
Cold Work Dies (Blanking, Forming)	VULDIE Air Hardening	C 1.00, Mn .70, Cr 5.25, Mo 1.10, V .30	1950– 2100	1700	1550– 1600	1300	1700– 1800	300– 1000	Air Movement A
Cutting Tools	SUPER High Speed	C .80, Cr 4.00, W 18.50, Mo .75, V 2.00	2000– 2200	1850	1600	1550	2350	1050	Oil, Air Movement B, A
Cutting Tools	TM-6 High Speed	C .83, Cr 4.15, W 6.40, Mo 5.00, V 1.90	1900– 2050	1800	1600	1500	2220	1025	Oil, Air Movement B, A
Cutting Tools	WOLFRAM High Speed	C .70, Cr 4.00, W 18.00, V 1.10	2000– 2200	1850	1600	1550	2350	1050	Oil, Air Movement B, A
Cutting Tools	WOLFRAM COBALT High Speed	C .72, Cr 4.00, W 18.00, Mo .50, V 1.00, Co 5.00	2000– 2200	1850	1600	1550	2350	1050	Oil, Air Movement B, A
Cutting Tools (Finishing)	REGAL	(Listed Above)							
Die Casting Dies (Brass)	A-42 Oil, Air Hardening		2000– 2200	1800	1600	1550	2200	1000– 1250	Oil, Air Movement B, A
Die Casting Dies	TCM Air Hardening	C .35, Cr 5.00, W 1.25, Mo 1.50, Si 1.00	1950– 2200	1800	1580	1350	1850	1050– 1200	Air Movement A
Gages	(See ALIDIE, NON-SHRINK, OIL HARDENING, VAIRLOY, Listed Above)								
High Stress, High Wear Machinery Parts	AUTO Oil Hardening		1800– 2100	1650	1450	1250	1500– 1650	600– 1250	Water, Oil Movement C, B
High Stress, High Wear Machinery Parts	HECLA Water, Oil Hardening		1800– 2100	1650	1450	1250	1500– 1650	400– 1250	Water, Oil Movement C, B
Hot Work Dies	A-41 Oil Hardening		1900– 2100	1650	1450	1350	1700	900– 1300	Oil Movement B
Hot Work Dies	Q. A. Oil Hardening	C .50, Cr 1.20, W 2.20, V .25	1900– 2100	1650	1450	1250	1620– 1750	400– 1200	Water, Oil Movement C, B
Hot Work Dies	.30 CALO FERRO Oil, Air Hardening	C .30, Cr 3.50, W 9.00, V .25	2000– 2200	1800	1600	1550	2000	1000– 1250	Oil, Air Movement B, A
Hot Work Dies	.45 CALO FERRO Oil, Air Hardening	C .45, Cr 3.00, W 13.00, V .25	2000– 2200	1800	1600	1550	2000	1050– 1250	Oil, Air Movement B, A
Hot Work Dies	(See A-42, TCM, Listed Above)								
Hot Work Dies (Forming)	4-HW Air Hardening	C .90, Cr 4.00, Mo .45, V .75	1800– 2050	1700	1450	1450	1700– 1800	900– 1200	Air Movement A
Hot Work Dies (Forming)	6-HW Air Hardening	C .60, Cr 4.00, Mo .45, V .75	1800– 2050	1700	1450	1450	1700– 1800	900– 1200	Air Movement A
Plastic Molding Dies (Hubbed)	PLASTIC DIE Water Hardening	C .10 max.	To Be Carburized		....	....	1460– 1560	400– 500	Water Movement B
Punching and Shearing	(See A-42, .30 CALO FERRO, .45 CALO FERRO, Q.A., Listed Above)								
Shock Resisting	BLUE EDGE Water, Oil Hardening	C .50, Cr 1.00, W 1.00	1900– 2100	1600	1450	1250	1525– 1625	400– 600	Water—Movement C Oil—Movement B
Shock Resisting	4S70 Water, Oil Hardening	C .55, Mn .85, Cr .25, V .30, Si 2.00	1800– 2100	1600	1400	1250	1650– 1750	400– 800	Water, Oil Movement C, B

Memo from our
RAW MATERIALS DEPT.

J&L STEEL

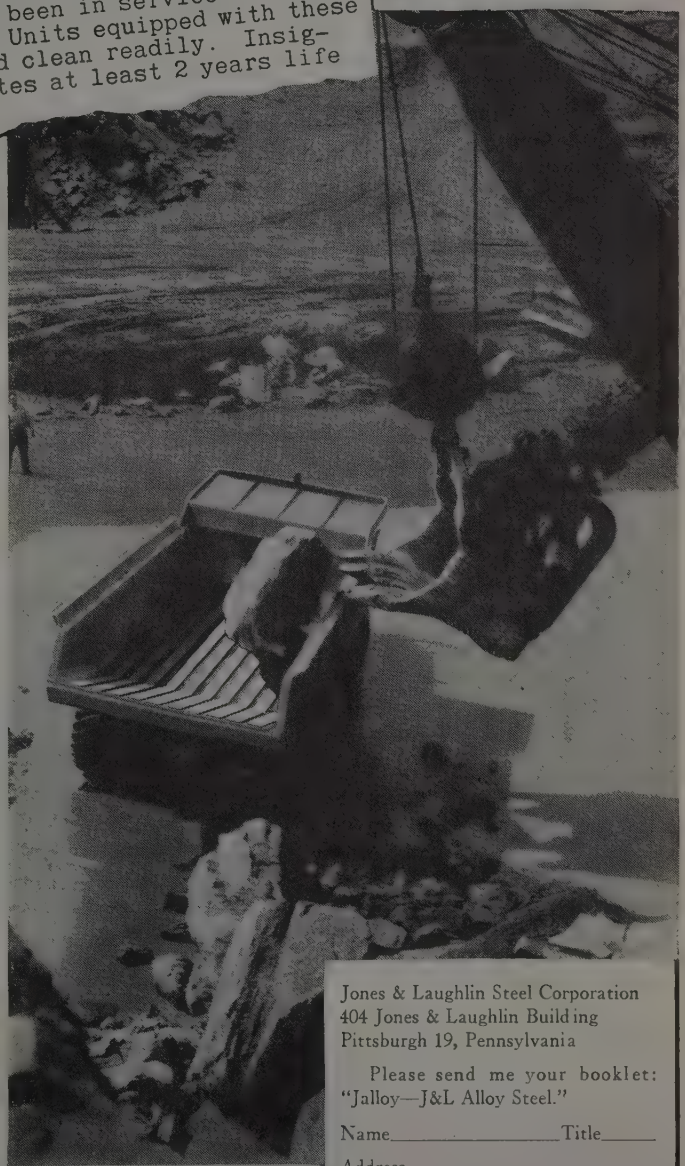
JONES & LAUGHLIN STEEL CORPORATION
OFFICE MEMORANDUM

DATE 8/11/48

TO. Metallurgical Dep't.

SUBJECT: Performance of Heat Treated JALLOY Steel at Benson Mines, Star Lake, N. Y.

1" x 6" heat-treated JALLOY #3 flats to reinforce truck-body bottoms and doors. Service--severe impact loading of hard rock magnetite ore from 5-yd. shovel. Year round operations in temperatures to minus 47°F. Severe abrasion in unloading. Installations have been in service 13 months --305,000 tons handled per truck. Units equipped with these flats maintain bottom flatness and clean readily. Insignificant wear at this date indicates at least 2 years life before replacement is necessary.



WHAT better "laboratory" could we find to prove the qualities of J&L Steel than in the equipment required in our own operations?

The handling and moving of heavy, abrasive ore-bearing rock, at our Benson Mines, is a rugged test for any equipment. Yet our stone trucks equipped with heat-treated J&L JALLOY Steel reinforcing strips have run *more than a year* without bottom replacements. *And recent reports indicate at least two years life!*

These JALLOY strips receive the full impact of huge rocks *dropped* into the truck bodies, and withstand the abrasion caused by dumping load after load. This continuous resistance to shock is particularly noteworthy because of the embrittling effect of the sub-zero temperatures encountered during winter months.

J&L JALLOY is a fine-grain, heat-treated steel made in a wide range of physical properties with tensile strengths of 155,000 to 180,000 lbs. per sq. inch. Its inherent ability to withstand shock and abrasion adds life to equipment that must be tough and strong—such as: Rock crushers, Scrapers, Bulldozers, Dump cars, Power-shovel buckets, Truck bodies, Sandblasting equipment—or wherever abrasion and impact are limiting factors.

Manufacturers of trucks and trailers designed for heavy service will find JALLOY an excellent material for body bottoms, reinforcing strips exposed to severe abrasion, tail gates and many other applications. You'll find that JALLOY is a steel that stands up when the going gets tough. For more complete information, let us send you the booklet: "*Jalloy*—J&L *Alloy Steel.*" It includes data on properties, heat treatments and workability. The coupon at the right is for your convenience.

Jones & Laughlin Steel Corporation
404 Jones & Laughlin Building
Pittsburgh 19, Pennsylvania

Please send me your booklet: "Jalloy—J&L Alloy Steel."

Name_____ Title_____

Address_____

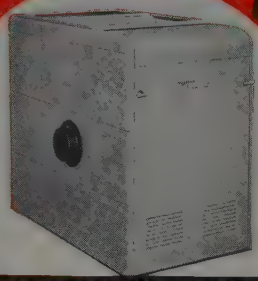
_____

JONES & LAUGHLIN STEEL CORPORATION

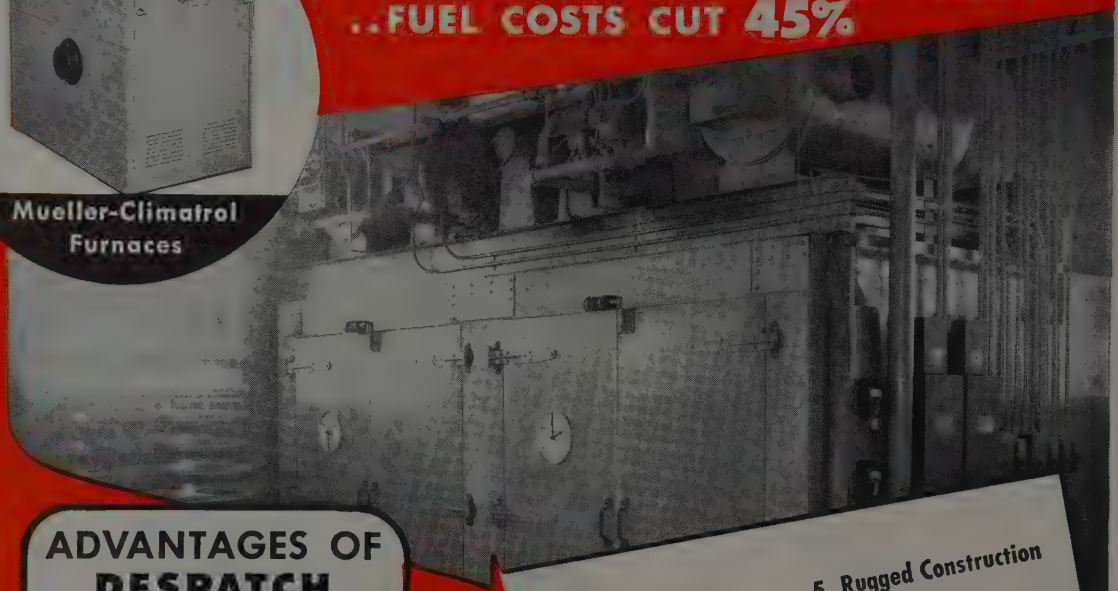
DESPATCH OVENS CHOSEN

for uniform finish ... and

PRODUCTION WAS BOOSTED 35%
..FUEL COSTS CUT 45%



Mueller-Climatrol Furnaces



ADVANTAGES OF DESPATCH Ovens As Rated By L. J. Mueller Furnace Co.

1. Bakes Faster
2. Cuts Baking Costs
3. Uniform Baking
4. Safety
5. Rugged Construction
6. Saves Floor Space
7. Low Orginal Cost
8. Saves Labor

When they wanted more uniform finish baking of their famous *Climatrol* furnaces, L. J. Mueller Co. of Milwaukee installed two DESPATCH automatically controlled, forced convection, gas fired ovens. *Result:* better finishing, and a bonus of 35% more production and 45% lower fuel costs.

Baking a wrinkle finish on 20 gauge steel panels for home air conditioning furnaces requires exact uniformity of color and texture. The finish must withstand rigorous conditions of heating, cooling, dampness, etc. Uniform heat distribution and exact temperature control give Mueller fast, high quality finishing.

For the two ovens, daily production is up to 30 loads in two 9½-hour shifts. Baking time is 1 hour at 265° F.

These ovens are typical of the 50,000 industrial heating, baking and drying installations made by DESPATCH in the past 46 years. DESPATCH builds industrial heat processing equipment from the smallest laboratory ovens to the largest mechanized systems. DESPATCH engineers can help you with your heat application problems.

WRITE TODAY for latest Despatch bulletin 51-K

DESPATCH *Designs - Builds* COMPLETE FINISHING SYSTEMS

Dip tank being used to apply finishes on bed springs before baking in a Despatch elevated type continuous conveyor oven.

A typical Despatch water wash spray booth for spraying finishes on motorcycle parts.

Minneapolis Office:
619 S.E. 8th Street

DESPATCH OVEN COMPANY

Chicago Office:
211 N. LaSalle Street

PRIMARY APPLICATION	TRADE NAME & TYPE	ANALYSIS (%)	SUGGESTED TEMPERATURE RANGES (°F)						Quenching Medium. ★ % Machinability Annealed. Movement in Hardening.
			Forging	Finish Forging	Annealing	Preheating	Hardening	Tempering	

WHEELOCK, LOVEJOY & CO. INC., 128 Sidney St., Cambridge 39, Mass. — Listing No. 52

Cold Work Dies	WHELCO STD. Water Hardening	C .95, Mn .30, V .03	1875	1500	1450	....	1390–1600*	375	Water Movement B

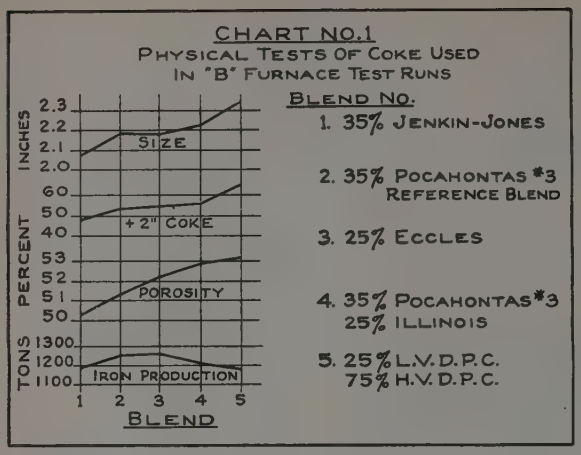
* Depending on depth desired

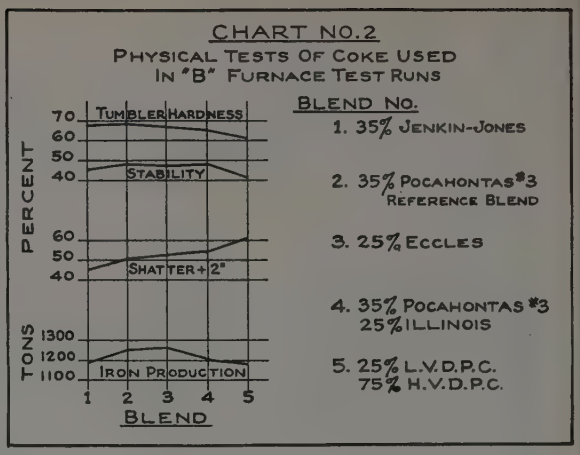
WILLEY'S CARBIDE TOOL CO., 1340 West Vernor Highway, Detroit 1, Mich. — Listing No. 53

General Machining—Steel (General purpose, all types of steel)	606, Carbide	
General Machining—Steel (Low speeds, heavy feeds)	710, Carbide	
General Machining—Steel (Precision turning and boring, tough)	509, Carbide	
Machining of Cast Iron, Brass, Aluminum, Nonmetallics, etc. (Finish Turning & Boring)	E-5, Carbide	
Machining of Cast Iron, Brass, Aluminum, Nonmetallics, etc. (Heavy Interrupted Cuts)	E-8, Carbide	
Machining of Cast Iron, Brass, Aluminum, Nonmetallics, etc. (Roughing, Semifinishing)	E-6, Carbide	
Wear Resistant Grade—Rest Blades, Centers, Gages, etc. (Shock Resisting)	E-12, Carbide	

ZIV STEEL & WIRE CO., 2945 W. Harrison St., Chicago 12, Ill. — Listing No. 54

Cold Work Dies (Blanking)	HARGUS Oil Hardening	C .85-.95, Mn 1.40-1.60, Cr .10-.15, Mo .20-.30, Si .25-.30	1900	....	1400–1425	800–1200	1430–1460	300–700	Oil
Cold Work Dies (Forming, Punches, Rolls)	PRK-33 (Darwin & Milner) Air Hardening	C 1.30-1.50, Mn .20-.30, Cr 12.00-13.00, Co 3.00-3.50, Si .40-.60	1750–1950	....	1575–1650	1250–1300	1650–1850	350–1100	Air
Cold Work Dies (Blanking, Forming)	NEOR (Darwin & Milner) Oil Hardening	C 2.10-2.30, Mn .40-.60, Cr 12.75-13.75, Si .40-.60, Ni .40-.60	1750–1950	....	1575–1650	1250–1300	1470	350–600	Oil
Cold Work Dies (Rolls)	DUMORE Air Hardening	C .95-1.05, Mn .50-.80, Cr 5.00-5.50, Mo .95-1.25, Si .10-.30	1900–2000	....	1550–1600	1200–1250	1800	300–1000	Air
Cutting Tools	SUPER HIGH SPEED Oil Hardening	C .65-.75, Mn .20-.35, Cr 3.50-4.50, W 17.50-19.00, V .90-1.20, Si .20-.35	1950–2100	....	1500–1650	1500–1600	2250–2375	1100	Oil
Gages	NEOR (Listed Above)								
Hobs	WIZARD Oil Hardening	C .40-.50, Mn .20-.40, Cr .85-.95, W .90-1.00, Mo .20, Si .15-.25	1700–1900	....	1425–1475	....	1650–1750	400	Oil
Hobs Cavity Dies	HOBALITE Water Hardening	C .05, Mn .16, Si .026	1900–2200	....	1250	....	....	....	Water
Hot Work Dies (Hammer)	TYPLEX Air Hardening	C .35-.45, Mn .25-.50, Cr 1.25-1.75, Mo .60-.90, V .15-.25, Ni 4.00-4.50	1850–1950	....	1240	1100	1670	950–1050	Air
Hot Work Dies (Upsetter)	TYPLEX (Listed Above)								
Machinery Parts	ZIVAN-45 Oil Hardening	C .40-.50, Mn .60-.90, Cr .80-1.10, V .15-.18	1950–2250	....	1550	....	1550–1600	....	Oil
Punching and Shearing	DUMORE (Listed Above)								
Punching and Shearing	PLANCHER Oil Hardening	C .60-.70, Mn .70-.90, Si 1.90-2.10	1600–1850	....	1450–1525	....	....	....	Oil
Shock Resisting	WIZARD (Listed Above)								





Effect of Coke Quality on

Blast Furnace Iron Tonnage

Definite change in coking quality of the low or high volatile coal used in the blend produces a definite change in the physical and chemical properties of the resulting coke. The conventional physical tests, per cent +2 in. coke, shatter, tumbler stability and hardness values are shown to be a satisfactory yardstick for measuring differences in quality of coke and their influence on blast furnace iron tonnage

By E. J. GARDNER
Supt., Blast Furnaces and Coke Plant
Inland Steel Co.
East Chicago, Ind.

ADVANTAGES to be gained by using good quality metallurgical coke for blast furnace operation have been recognized by coke plant operators and furnace men since the days when Connellsville coke was the standard.

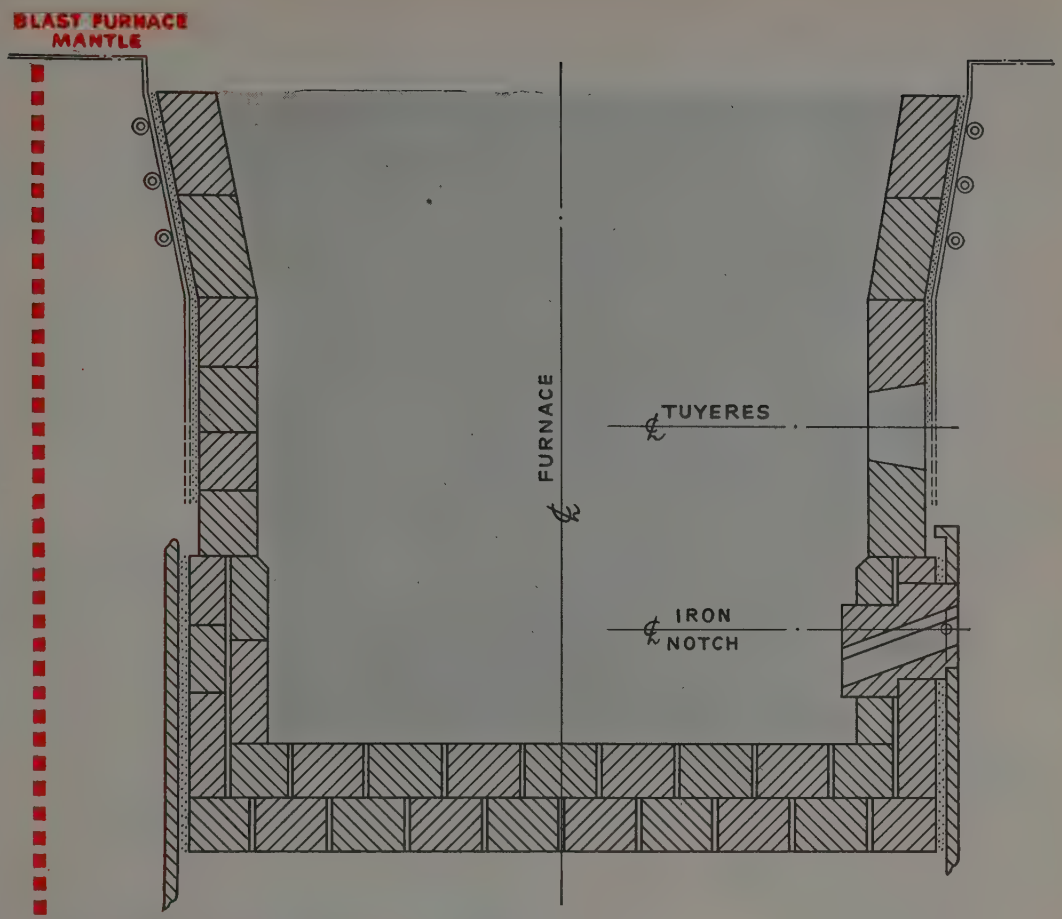
In the past 30 years, methods used for judging suitability of byproduct coke for blast furnace operation have undergone considerable development. In the early days metallurgical coke was judged by is appearance. With improvement in technical standards, it soon became necessary to develop standard tests which were not affected by the human equation. First of the more practical methods of evaluating coke was the making of screen tests on material delivered to the furnaces. Variation in the percentages of various sizes of coke, which accompanied changes in the coal mixture, coking time and flue temperature at the coke plant, furnished a more scientific method of correlating blast furnace operation and coke quality. Next step was the adoption of physical tests to measure hardness and strength of the coke; the shatter test giving a measure of the impact hardness and tendency to fracture, and the tumbler test for measuring resistance to abrasion.

Even though existing coke physical tests are suitable for detecting changes in the percentage of low volatile coal used in the mixture, changes in the type or rank of coal used, also the effect of variations in coking time on the physical properties, furnace coke must still be rated according to its performance in the blast furnace, taking into consideration other variables that may occur in blast furnace operations other than those found in coke quality.

Present Day Research—From our investigations on means of improving quality of the coke, we have learned that one must know more about coal and its expansion and carbonization properties. Quality of blast furnace coke originates at the mine and we must select high grade coking coals in order to produce top quality blast furnace coke.

In order to evaluate coking characteristics of the low and high volatile coals that we use regularly, and to aid in the selection of safe expanding and satisfactory coking coals to supplement our supply, we have made over 700 carbonization tests in our Koppers movable-wall expansion test oven. These expansion tests show that for our practice, where we crush our coal so that 80 per cent passes through a ⅛-inch square mesh screen, using a blend of 35 per cent Pocahontas No. 3 seam and 65 per cent Elkhorn coals—3.50 lbs per square inch is the maximum expansion pressure of the blend which we can charge safely in our ovens. In addition, physical tests of the cokes made in the movable-wall test oven are indicative of what may be expected from the same coal mixture when coked in the plant ovens.

In the last few years, Inland Steel Co., as well as other plants in the industry, were faced with the problem of finding a suitable substitute for our rapidly depleting supply of No. 3 seam Pocahontas coal. We had been purchasing No. 3 seam Pocahontas for blending with Elkhorn No. 3 seam coal from the Inland owned mine at Wheelwright, Ky., to make metallurgical coke. The solution to this problem developed into a plant scale research investigation where selected coal blends were carbonized under identical oven operating procedures. The resulting furnace cokes were used in succeeding tests on one blast furnace, where operations were



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maintained as uniformly as possible, so that iron production would be indicative of coke quality. Complete details of these extensive tests appear in the Inland publication, "Investigation of Beckley Seam Coal Blended with Wheelwright Coal for Use in the Production of Metallurgical Coke."

Effect of Coke Quality on Blast Furnace Output—Koppers underjet ovens, with a coal capacity of 17 tons, located at our Plant No. 3, were used for this program. Coking time was 17 minutes and 22 seconds; airport temperature averaged 2338-2351° F, sliding brick temperature averaged 2068-2120° F.

Significant dimensions of "B" blast furnace used in these tests are:

Hearth Diameter	25 ft 9 in.
Bosh Diameter	28 ft 9 in.
Stockline Diameter	20 ft
Large Bell Diameter	15 ft
Total Height	100 ft 11½ in.
Working Height	79 ft
Working Volume	39524 cu ft

During these tests wind was kept as closely as possible to 72,000 cubic feet per minute and no changes were made in the burden.

The effect of changes in coke quality on blast furnace iron tonnage will be presented by analyzing physical properties and furnace performance of the coke produced from the following blends:

1. 35% Jenkin-Jones Pocahontas (24% V.M.)
   65% Wheelwright Elkhorn No. 3 Seam
2. 35% Pocahontas No. 3 Seam (19% V.M.)
   65% Wheelwright Elkhorn No. 3 Seam
3. 35% Pocahontas Beckley Seam
   65% Wheelwright Elkhorn No. 3 Seam
4. 35% Pocahontas No. 3 Seam
   25% Illinois
   40% Wheelwright Elkhorn No. 3 Seam
5. 25% Miscellaneous Pocahontas Coals
   75% Miscellaneous High Volatile Coals
6. 35% Weathered Pocahontas Coal
   65% Miscellaneous High Volatile Coals

Table I shows the expansion pressures of the blends and ash content and physical properties of the furnace cokes used in the blast furnace testing program.

The 35 per cent Jenkin-Jones-65 per cent Wheelwright blend produced small, dense coke. The average size was 2.08 in., the porosity being 50.4 per cent. Shatter test and tumbler stability were both 45.4 per cent.

When a better grade low volatile coal was used in the blend, for example, our 35 per cent No. 3 seam Pocahontas-65 per cent Wheelwright, the coke was blocky and there was a definite increase in size, shatter and tumbler stability values.

In the 25 per cent Eccles-75 per cent Wheelwright blend, physical properties of the coke produced were similar to the 35 per cent Pocahontas No. 3-65 per cent Wheelwright blend. Coke size was 2.18 in. and 2.19 in., the shatter test—53 per cent and 51 per cent, and the tumbler stability—47.5 per cent and 48.6 per cent respectively. This gave us a measure of the comparative values of the No. 3 seam and Beckley Pocahontas coals.

Substituting a higher oxygen coal, such as Illinois coal for some of the Wheelwright, produced definite changes in coke structure. Coke from this blend was larger in size and had a darker and rougher surface than that from our 35 per cent Pocahontas-65 per cent Wheelwright blend. A comparison of the physical properties of both cokes showed that the addition of 25 per cent Illinois coal produced an increase in the Shatter test +2 inch, the tumbler stability factor remained the same and the tumbler hardness factor of 66.1 per cent was lower than the regular Pocahontas-Wheelwright blend. Ash content was increased from 7.1 per cent to 8.4 per cent.

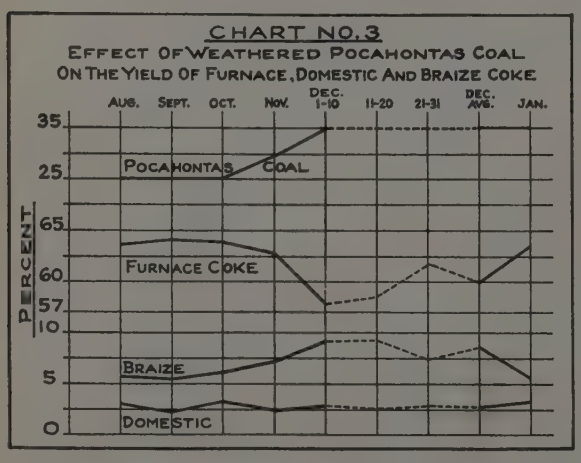
Finally our Plant No. 3 blend of miscellaneous low and high volatile West Virginia and Eastern Kentucky high ash coals produced large coke. The average size was 2.34-inch and the shatter index was 61.2 per cent. The strength, as measured by tumbler stability and hardness factors, 40.9 per cent and 61 per cent, was the lowest on the list.

Comparison of Production with Blended Cokes—Table II lists some of the important physical properties of coke from the various blends and a summary of "B" blast furnace operating results when using the test blend cokes.

During the No. 1 test period, iron production was 1197 tons per day as compared with 1184 tons per day while on the Plant No. 3 regular blend (No. 5 test period)—a slight increase. Based on comparative ash analyses, 6.70 per cent and 10.7 per cent, and the pounds of slag produced per cent of iron, 906 and 1040 pounds respectively, the iron production should have increased 3 per cent, or from 1184 to 1220 tons of iron per day. We can conclude, therefore, that coke produced from the No. 1 blend possesses physical characteristics such as exceptionally small size, lower shatter index, and high apparent

TABLE I
SIGNIFICANT DATA ON COKE USED IN "B" FURNACE TEST RUNS

Blend	Exp. Press. of Blend Lbs. Per Sq. In.	% Coke Ash	Avg. Coke Size	% +2" Coke	Shatter % +2"	Tumbler Test % +1"	Tumbler Test % +¼"	Porosity %
1. 35% Jenkin-Jones 65% Wheelwright	2.00	6.7	2.08"	47.9	45.4	45.4	68.5	50.4
2. 35% Pocahontas #3 65% Wheelwright	3.60	7.1	2.19"	53.0	51.1	48.6	68.7	51.4
3. 25% Eccles (Beckley) 75% Wheelwright 35% Pocahontas #3	3.40	7.0	2.18"	55.0	53.0	47.5	67.2	52.3
4. 25% Illinois 40% Wheelwright	2.20	8.4	2.22"	55.7	55.0	48.8	66.1	52.9
5. 25% Misc. Low Volatile 75% Misc. High Volatile	1.60	10.7	2.34"	64.7	61.2	40.9	61.0	53.1



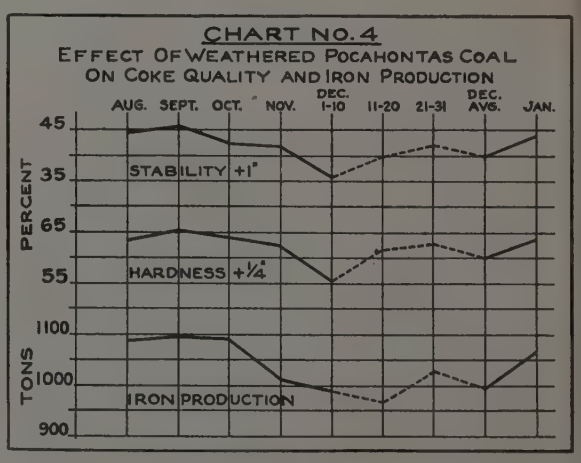


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TABLE II
"B" FURNACE OPERATION

Blend	Test Period Days	% Coke Ash	Tumbler Test % +1"	Tumbler Test % +¼"	Iron Produced Net Tons/D	Coke Consumed Lbs./ Ton	Slag Volume Lbs/ Ton	Wind C.F.M.	Burden Lbs./Chge.
1. 35% Jenkin-Jones 65% Wheelwright	37	6.7	45.4	68.5	1197	1653	906	71800	36400
2. 35% Pocahontas #3 65% Wheelwright	23	7.1	48.6	68.7	1254	1644	906	71800	37500
3. 25% Eccles (Beckley) 75% Wheelwright	23	7.0	47.5	67.2	1260	1675	913	71900	37100
35% Pocahontas #3									
4. 25% Illinois 40% Wheelwright	23	8.4	48.8	66.1	1206	1771	962	71600	35600
5. 25% Misc. Low Volatile 75% Misc. High Volatile	37	10.7	40.9	61.0	1184	1720	1040	71900	35100

TABLE III
PLANT NO. 3 COKE OVEN AND "B" FURNACE DATA BEFORE AND DURING PERIOD WHEN WEATHERED POCAHONTAS COAL WAS USED IN THE COAL BLEND "B"

Date	Coal Mix L.V.	Coal Mix H.V.	Coking Time	Per Cent of Coal Furnace	Per Cent of Coal Domestic	Per Cent of Coal Braize	% Ash in Coke	Tumbler Test +1"	Tumbler Test +¼"	Furnace Iron Tons/ Day	Furnace Coke Lbs./ Ton	C.F.M.
Aug. 1947	25%	75%	17'30"	63.5%	3.0%	5.6%	11.90	44.5	63.7	1090	1928	73800
Sept. 1947	25%	75%	17'21"	64.0	2.3	5.4	11.10	45.8	65.2	1098	1873	72800
Oct. 1947	25%	75%	17'18"	63.9	3.1	6.0	11.90	42.6	64.0	1081	1925	72300
Nov. 1947	29.3	70.7	17'22"	62.8	2.4	7.1	10.55	41.8	62.4	1014	1953	69500
December, 1947												
1-10	35	65		57.9	2.9	9.2	9.90	35.7	55.2	990	1911	68900
11-20	35	65		58.4	2.7	9.2	10.30	39.9	61.6	968	1927	68430
21-31	35	65		61.8	2.9	7.4	9.85	41.9	62.9	1031	1847	68870
Dec. Avg.	35	65	17'24"	60.0	2.8	8.6	10.00	39.4	59.9	997	1895	68670
Jan. 1948	35	65	17'18"	63.6	3.1	5.5	9.30	43.6	63.5	1067	1899	71635

gravity (dense structure), which do not promote a high degree of efficiency in the smelting operation, or high iron production.

There was a definite increase in iron production during the No. 2 test period—1254 tons, compared with 1197 tons for the No. 1 test period. The 4.7 per cent increase in iron production was accomplished with a slightly lower coke consumption—1644 lbs per ton of iron, compared with 1653 lbs for the No. 1 test coke.

Since all of the furnace operating procedures were maintained as uniformly as possible during these two periods, the increase in iron production of 57 tons per day obtained when using coke from the No. 2 test period must be attributed to the more desirable physical properties of this coke; namely, larger size, blockier coke, higher shatter and stability factors and more porous coke structure.

During the No. 3 test period, iron production was 1260 tons per day. There was a slight increase in coke consumption—1675 lbs per ton of iron, compared with 1644 tons for the No. 2 blend. During these two periods there was an increase in the amount of burden carried as compared with the No. 1 test.

Similarity in iron production tonnages for the No. 2 and No. 3 test periods confirms the presence of a combination of similar desirable physical properties, as measured by average size, shatter index, tumbler stability and porosity in the furnace coke produced from these two blends.

During the No. 2 and No. 3 periods, blast furnace operators reported that fewer changes were required to maintain uniform gas flow and maximum iron production as compared with the No. 1 test period.

The No. 4 test shows an average iron production of 1206 tons per day as compared with 1260 and 1254 tons for the No. 3 and No. 2 tests. There was also a decrease in the burden carried—35,600 lbs, compared with 37,500 and 37,100 lbs for the No. 2 and No. 3 tests.

Based on the results obtained on the furnace during the No. 4 test period, indications are that this coke is not as efficient as that from the No. 2 blend.

Tests of Coke Used in "B" Furnace—We have also set up the physical test data from the five blends and the corresponding iron production in the form of curves to show the effect of coke quality, as measured by conventional test methods, on iron production.

1—The curves, comparing average size of coke and per cent of +2 inch coke with iron production, show an ascending stepwise pattern as we proceed from blend No. 1 to No. 5. There is a leveling off at an apparently optimum value of 2.20 in. for average size and 54 per cent +2 in. coke for the maximum iron production obtained with blends No. 2 and No. 3.

The porosity curve shows a gradual rise from the dense No. 1 blend coke to the more open structure of the No. 4 blend. In these controlled experimental runs desirable porosity appears to be between 51-53 per cent.

2—An examination of the curves, comparing shatter and tumbler test factors with iron production, shows that the curve for the shatter test +2 inch values is similar in pattern and gives about the same values as the curve for per cent of +2 inch coke.

The tumbler test stability curve shows uniform values for blends Nos. 2, 3 and 4. Blend No. 1 shows a lower stability factor, while blend No. 5 has the lowest stability value.

The tumbler hardness factors show a decrease with blend No. 3. There is a further decrease in blend No. 4. The furnace coke for blend No. 5 shows the lowest hardness factor.

Thus far we have presented data comparing physical properties of cokes used in our plant scale research program and their effect on blast furnace performance.

Next we shall describe some of the significant facts about our experience when carbonizing blends of 30-35 per cent miscellaneous weathered Pocahontas coals, blended with miscellaneous Kentucky and West Virginia high volatile coals and use of the resulting coke in the blast fur-

Effect of Weathered Coal on Coke Quality—During November and December 1947, while using miscellaneous low and high volatile coals, it was noted that on certain days coke pushed from our Plant No. 3 ovens contained an excessive amount of braize. On the wharf the larger pieces of coke had a pebbly appearance and there was so much braize formed that it was difficult for the coke to slide down the wharf incline to reach the belt conveyor. The volatile matter content of the coke was normal.

Physical tests of the coke produced during this period showed a decided drop in the tumbler stability and hardness values as compared with preceding months when braize production was normal.

The pebbly appearance of the coke on the wharf, the excessive amount of braize, and the extremely low tumbler stability and hardness factors of the furnace coke, all indicated that weathered, poorly coking coal was being charged to the ovens.

An examination of our laboratory analyses and test oven carbonization reports showed that we received considerable tonnage of strip mine Pocahontas coal in October and November. This coal had a satisfactory chemical analysis — volatile matter, ash and sulphur content. However, low tumbler stability and hardness values of the test oven cokes produced from blends of the strip mine Pocahontas with Wheelwright confirmed the presence of weathered Pocahontas coal.

Coke Oven and Furnace Data —

(*Please turn to Page* 116)

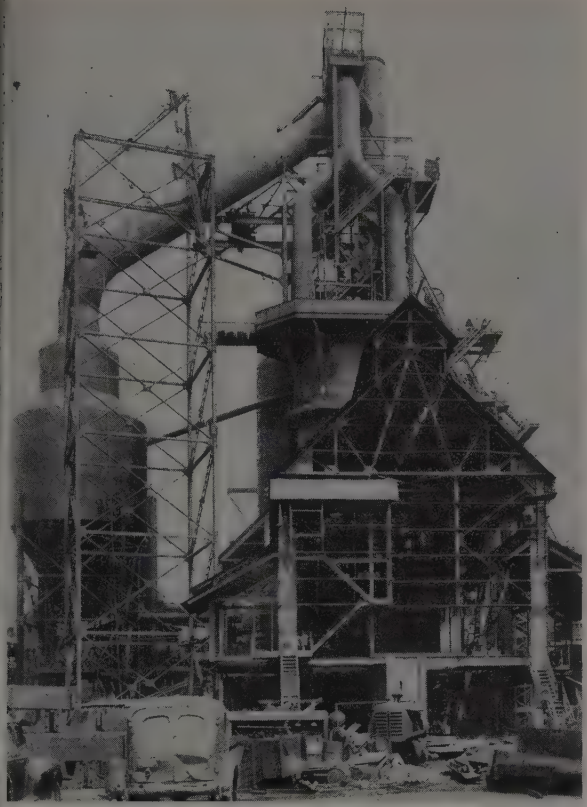

Fig. 1—Steel shell and top structure being moved to permanent location

Fig. 2—New furnace in the nearly completed stage

Builds New Blast Furnace in 97 Days

Steel shell and top structure erected on temporary foundation are moved to permanent location following the dismantling of original furnace. New furnace blown with 18 tuyeres

By JOHN D. KNOX
Steel Plant Editor
STEEL, Cleveland

A TIME-SAVING means of building a new blast furnace on the site of an old—a unique engineering feat in itself—recently was employed by the Youngstown Sheet & Tube Co. at its Indiana Harbor, Ind. plant.

With the original No. 1 stack still in blast, engineers of the Arthur G. McKee & Co., Cleveland, started the erection of the furnace shell, offtakes and uptakes, and top structure on a temporary structural steel foundation positioned 131 feet 6 inches from the permanent location.

When the plate work was well on its way to completion the old No. 1 stack was blown out and its salamander tapped. Dismantling was started which included tearing down the furnace and removing its foundations.

Meanwhile, work was started on the installation of a new dust catcher and gas washer. The three original stoves for supplying hot blast were enlarged by increasing their height approximately 20 feet and were equipped with new linings, burners, fittings and hot blast main. A new hoist house and equipment, a new skip bridge, and a new central coke bin also were installed.

When the new concrete foundation was completed on the site of the old and the furnace columns were in place, work of transferring the furnace shell and appurtenances from its off-site station across a specially constructed rail platform to its permanent location—a distance of 131½ feet—was started. The shell mounted on rollers was pulled this distance by a steel cable and winch. The moving was executed by John Eichleay Engineering Corp., Pittsburgh.

While the shell with its offtakes, uptakes and top structures was being lowered about 4 feet to the foundation band by means of short jacks, the masons began to install the lining, and while this was being done a new cast house was built. It will be noticed that it was necessary to move the new stack across the site of the cast house before work of laying down a new structure could be undertaken.

A noteworthy feature is that only 97 days elapsed from the time the old furnace went out of blast until iron was tapped from the new stack.

The original No. 1 stack, built in 1917, was 91 feet 11 inches high and had a hearth diameter of 18 feet 6 inches. When first blown in it had a daily capacity of 700 tons and was considered one of the most modern stacks in the Calumet district. The modern stack stands 104 feet high and has a 26-foot hearth. It will be blown with 18 tuyeres.

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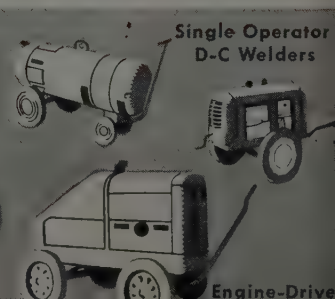

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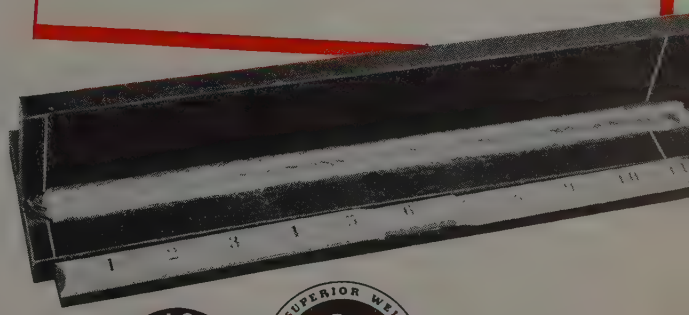

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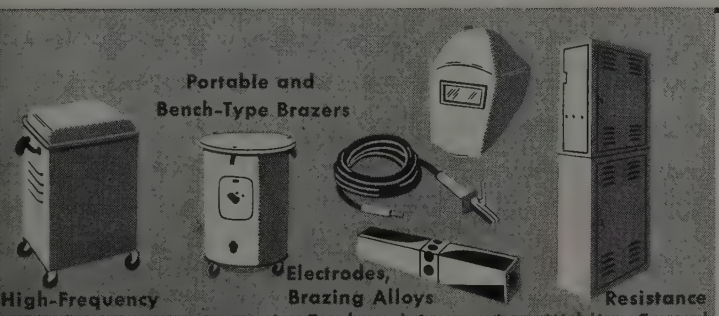

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- ☐ Multiple Operator Welders
- ☐ Engine-Driven Welder
- ☐ HF Stabilizers
- ☐ Brazers
- ☐ Electrodes
- ☐ Resistance Welding Control

Name

Company

Address

NEW Copper Base Alloys Possess Unusual Properties

Property	602 Wrought Condition Cold-Drawn Bars (up to 1" diam.)	602 Heat Treated Cold Drawn Rod (up to 1" diam.)	602 Heat Treated Castings	602 Heat Treated Sheet, Strip	603 Cold-Drawn Rod H.T. (up to 1" diam.)	603 Castings Heat Treated	603 Sheet or Strip H.T.	603 Sheet or Strip Forming Temper	606 Cold-Drawn Rod H.T. (up to 1" diam.)	606 H.T.	606 Sheet or Strip Forming Temper	607 Cold-Drawn Rod (up to 1" diam.) Fully H.T.	607 Cold-Drawn Rod (up to 1" diam.) As Drawn*	607 Castings Heat Treated	607 Sheet or Strip Heat Treated**	607 Sheet or Strip As Rolled***
Rockwell Hardness	B70	B80	B65	B80	B-90-100	B90-95	B90-100	B85-95	B90-100	B90-100	B85-95	C33-42	B80-100	C37-41	C37-44	B85-100
Electrical Conductivity % IACS	85	80	75	80	50	50	50	52	53	53	55	21–24	16–17	21–24	21–24	16–17
Ultimate Tensile Strength psi	65,000	75,000	50,000	75,000	100,000–120,000	85,000–100,000	110,000–130,000	95,000–120,000	95,000–115,000	100,000–120,000	90,000–110,000	175,000–195,000	90,000–105,000	155,000–170,000	190,000–205,000	95,000–110,000
Proportional Limit psi	20,000	35,000	27,000	35,000	65,000	50,000	65,000	55,000	60,000	60,000	55,000	95,000	50,000	75,000	95,000	50,000
Yield Strength, 0.2% off-set, psi	55,000	70,000	40,000	70,000	100,000	80,000	100,000	90,000	95,000	95,000	90,000	170,000	80,000	140,000	175,000	85,000
Young's Modulus of Elasticity, psi	16,000,000	16,000,000	16,000,000	16,000,000	18,000,000 8–12	18,000,000 8–15	18,000,000 5–12	18,000,000 8–15	17,500,000 10–15	17,500,000 8–12	17,500,000 10–15	19,000,000 2–5	17,000,000 10–15	19,000,000 1.5–3.00	19,000,000 2–4	17,000,000 5–10
Elongation, % in 2"	20	15	15	15												
Thermal Conductivity, CGS Units	0.82	0.77	0.77	0.77	0.50	0.50	0.50	0.55	0.55	0.55	0.80	0.27	0.16	0.27	0.27	0.16
Coefficient of Expansion, inches/inch/°C at 20° C.	0.000017	0.000017	0.000017	0.000017	0.000017	0.000017	0.000017	0.000017	0.000017	0.000017	0.000017	0.0000167†	0.0000166†	0.0000167†	0.0000167†	0.0000166†
Annealing Temperature °F.	660	930	930	930	1020	1020	1020	1020	1020	1020	1020	0.0000177‡ 707	0.0000178‡ 707	0.0000177‡ 707	0.0000177‡ 707	0.0000178‡ 707

* Annealed and drawn 3 B & S Numbers hard
** Annealed, rolled 2 B & S Numbers hard, and aged
*** Annealed and rolled 2 B & S Numbers hard
† 20° C-100° C
‡ 20° C-300° C

FIVE new copper base alloys for electrical and mechanical applications, other than resistance welding, were introduced recently by Fansteel Metallurgical Corp., North Chicago, Ill. They are designated 601, 602, 603, 606 and 607.

Possessing properties of greater strength, resistance to deformation and wear and higher elasticity than copper, brass or the common bronzes, these alloys retain high thermal and electrical conductivity.

All of the new alloys are produced in bars (square, rectangular, hexagonal), rods, slabs, sheet, coiled strip and fabricated parts. Castings of the metals, except 601, are made to order.

601—Cold working gives the 601 metal excellent physical and mechanical properties. Strength, hardness and wear resistance greater than that of copper are possessed. The metal resists annealing up to 350° C, and is resistant to electrical erosion such as is encountered in electrical contact materials. Corrosion resistance is virtually the same as that of pure copper. One suggested use for the metal is soldering iron tips because it retains its point or edge.

602—Heat treatable, this material is superior to hard-drawn copper because it can be heated for relatively longer periods at temperatures up to 500° C without losing its hardness or strength. These properties make it highly useful in applications involving excessive electrical overloads or elevated temperatures. The metal has greater fatigue strength and wear resistance than copper, and twice the creep strength of hard-drawn copper at 100° C. Suggested uses for the metal include: Arc welding electrode jaws, collector rings, electrode holders and parts for carbon arc furnaces, circuit breaker parts, commutator segments, current carrying terminals and studs, structural parts of high frequency induction furnaces, acetylene torch tips, oil burner nozzles, wire and cable connectors, battery and connector clips, and soldering iron tips.

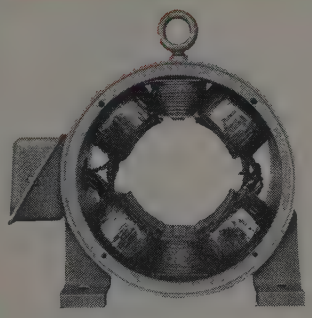
603—In contrast to copper, the 603 metal is stronger, harder, has higher elasticity and greater resistance to fatigue. At elevated temperatures it resists annealing to a much greater extent than copper and conventional brasses and bronzes. It has proved extremely useful in electric-current-carrying springs because it combines high electrical conductivity with high tensile, yield and fatigue strengths. It may be used in continuous operation at temperatures up to 750° F and in intermittent operations up to 1020° F without significant loss of room temperature properties. Where manufacturing operations require severe forming, the forming temper is recommended; however, the metal in the fully heat treated temper has enough ductility for most forming operations. In either temper, it can be formed without regard to the direction in which it has been rolled, a condition not found in cold-rolled phosphor bronze or nickel silver. Possible uses include: Springs, vibrator arms, circuit breaker parts, switch blades, aircraft engine parts, etc.

606—This high strength heat-treatable metal is superior in electrical and thermal conductivity, machinability and coefficient of friction to other similar alloys. In its forming ease and high temperature use it resembles metal 603, and its uses are much the same.

607—Possessing a unique combination of properties, this metal offers distinct advantages for current-carrying parts which are subjected to continuous or intermittent mechanical stresses, bending, fatigue, abrasion, heat and impact. Fansteel

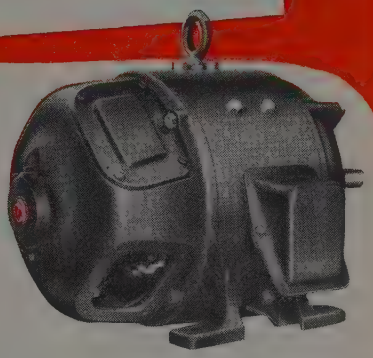
Century Direct Current Motors

Correct Design, Rugged Construction Mean Long Life and Top Performance



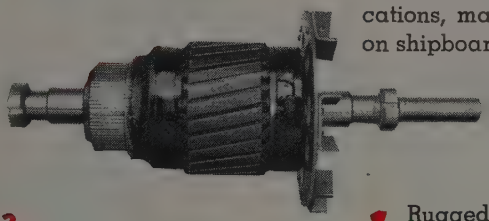
1

Nearly 50 years of experience and know-how have gone into the development of modern Century Direct Current motors. From this background Century engineers have developed a complete line of DC motors from 1/6 to 300 horsepower — available for any application where direct current is used.



Century 3 horsepower Direct Current open rated (1249A) ball bearing motor, equipped with protecting covers

Typical applications are wire drawing machines, steel mill applications, machine tools, motion picture machines, marine equipment on shipboard, cranes and hoists, oil field equipment and applications requiring adjustable voltage speed control.

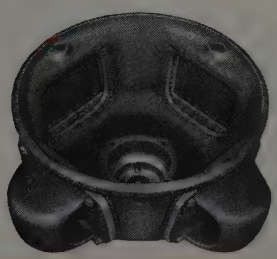


2

Here are some of the construction features that make them rugged, sturdy, dependable sources of electric power.

3

1. Rugged steel frame with accurate machining. Stays rigid, maintains proper air gap between field and armature. Windings are neat, compact, thoroughly saturated with insulating compound.
2. Armature is built upon a stiff steel shaft. Mica insulated commutator is large. Large fan assures adequate ventilation.
3. Strong, durable brass brush holder keeps brushes securely in position. Rugged construction contributes to long life. (Shown mounted on inside bearing cap.)
4. Illustration is of a splash proof end bracket assembly for ball bearing motor. Accurately machined to maintain shaft in alignment.



4

These and other features of Century Direct Current motors contribute to their long life of top performance.

In addition to DC motors, Century builds a complete line of electric motors and generators from 1/6 to 400 horsepower to meet the requirements of industrial and commercial applications.

Popular types and ratings are available from factory and branch office stocks.

Specify Century motors for all your electric power requirements.

CENTURY ELECTRIC CO. • 1806 Pine St., St. Louis 3, Missouri

Offices and Stock Points in Principal Cities

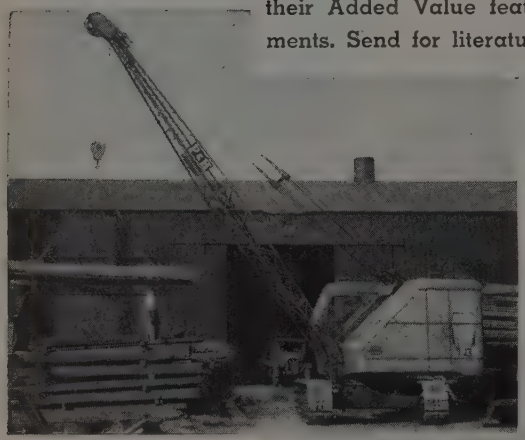
593

Century C MOTORS

P&H Crawler Cranes do yard jobs

FASTER, SAFER, AT A SAVING!

Have you the handling efficiency outside your plant that you have inside? P&H Crawler Cranes can give you fast, flexible, versatile yard service with one-man operation — to speed materials handling. P&H Crawler Cranes with their Added Value features are wise investments. Send for literature!



CRAWLER

P&H Crawler Cranes are easy to operate because of P&H's smooth, responsive hydraulic control. You can operate them in close quarters because of P&H's exclusive and simplified method of steering and braking.

MAGNET

Equipped with magnet, the P&H Crawler Crane loads scrap quickly. For those countless lifting jobs in plant yards, you can make no better choice than a P&H. Its construction of rolled alloy steels means extra long, trouble-free service.

CLAMSHELL

Bulk materials are moved speedily and easily with a P&H Crawler clamshell and movement is not restricted to inplace trackage. In addition P&H clear-view, all-weather cabs permit year-round operation.

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4471 West National Avenue
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HARNISCHFEGER CORPORATION

There's a P&H Industrial Crawler Crane to Meet Your Requirements. Write Today for Bulletins!

claims that when heat treated the metal has a strength and hardness not surpassed by any other copper base alloy. Its endurance resistance is almost equal to spring steel, and a piece of the metal of the same strength as any of the so-called "light-weight" alloys weighs less than the corresponding piece of that metal. It has the same corrosion resistance as pure copper and a higher endurance strength than steel under most corrosive conditions. The suggested applications include components in which constant tension and electric load carrying characteristics are desirable, as well as such uses as tools when non-sparking and hardness and impact characteristics are necessary.

Accompanying table shows properties of the various metals, gives typical values. Where ranges are given, the lower figure corresponds to the minimum generally used in inspection procedures, the upper figure being regarded as a value slightly higher than average although in no case the maximum obtainable.

Wide Application Seen For New Thermoplastic

Kel-F, a high temperature thermoplastic now in commercial production in limited quantities by M. W. Kellogg Co., Jersey City, N. J., is expected to find many applications as pump packing, tubing and instrument dials where corrosive gases or liquids are present, and in signal devices, outdoor seals, electric insulation, etc., where its nonaffinity for water is desirable. Used as insulation, the material would permit relatively higher temperatures in electrical equipment than are now commonly used and would enable the equipment to operate efficiently in corrosive atmospheres.

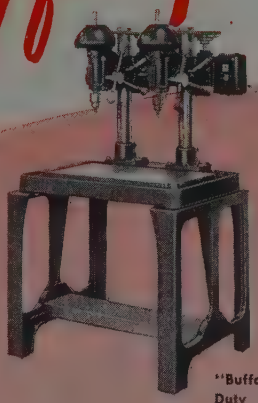
The material, while being easily workable in conventional equipment operating in the range of 550-600 degrees F, is strong and hard although not brittle. Its usefulness is not confined to relatively high temperature applications since it has satisfactory properties at as low as −320°F. In addition, it may be heat-treated to impart desirable characteristics for specific uses.

—o—

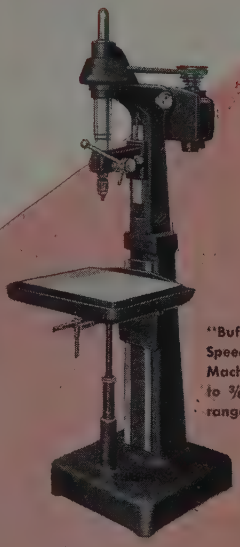
Quick switching in and out of die presses of the many huge dies required in the manufacture of automobiles at Oldsmobile Division of General Motors Corp., Lansing, Mich., will be performed with an 80,000-pound capacity electric industrial truck ordered from Automatic Transportation Co., Chicago.

FOR LOWER MANUFACTURING COSTS

LET THE RIGHT DRILL *Save Money for You*

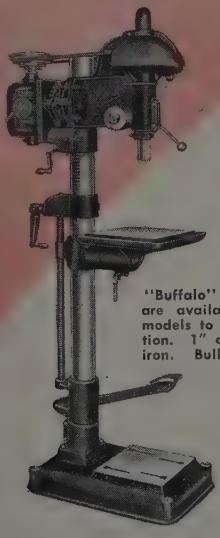


"Buffalo" No. 15 Heavy-Duty Production Drill for fast work up to ½" holes. Bulletin 2963-D.



"Buffalo" No. 14 High Speed Sensitive Drilling Machine with capacity up to ⅜" in the highest speed range. Bulletin 2726-D.

"Buffalo" No. 16 Drills have sensitive and power feed—are available in 8", 12" or 15" overhang. Capacity, up to ⅞". Bulletin 2730-F.



"Buffalo" No. 18 Drills are available in twelve models to fit your operation. 1" capacity in cast iron. Bulletin 3123-B.

"Buffalo" DRILLS

The right "Buffalo" Drill will save you money in any shop by providing ACCURATE SPEED in your drilling and faster setup changes. "Buffalo" Drills are precision-built machines—rigid for accuracy. All controls are easily reached, easily handled. Single and multispindle, floor and bench models, to suit your operation. Let us send you FACTS on getting *your* drilling costs down! Write for Bulletins!

BUFFALO FORGE COMPANY

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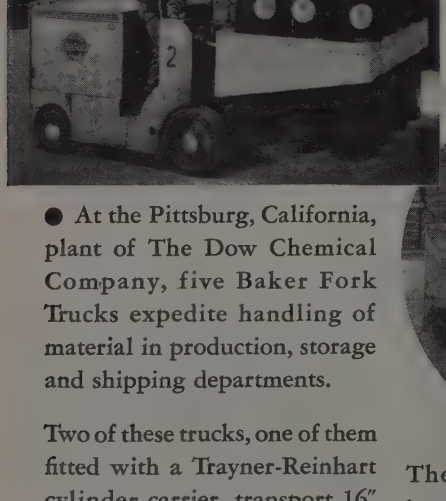
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

MACHINE TOOLS by "Buffalo"

- ★ BACK SPOT FACERS
- ★ BAR CUTTERS
- ★ BENDING ROLLS
- ★ BILLET SHEARS
- ★ DOUBLE END PUNCHES AND SHEARS
- ★ LOCOMOTIVE SHEARS
- ★ MILL TYPE SHEARS
- ★ RAPID ACTING PUNCHES
- ★ SINGLE END SHEARS
- ★ SPRUE CUTTERS
- ★ STRUCTURAL IRON WORKERS
- ★ UNIVERSAL IRON WORKERS
- ★ DRILLS FOR THE PRODUCTION LINE DRILLS FOR THE TOOL ROOM

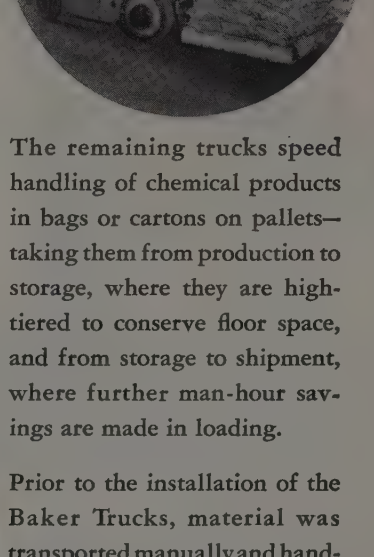
CONTINUOUS SERVICE—FASTER OPERATION—PEAK ACCURACY

DOW CHEMICAL saves thousands of dollars annually with BAKER TRUCKS



Baker Fork Truck with Trayner-Reinhart cylinder carrier easily transports twelve 16" cylinders.

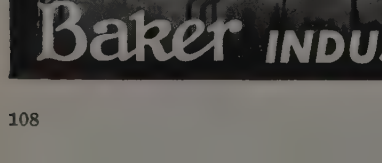
Bagged material, stacked on pallets as it comes from the line, is tiered to the ceiling in storage.



● At the Pittsburg, California, plant of The Dow Chemical Company, five Baker Fork Trucks expedite handling of material in production, storage and shipping departments.

Two of these trucks, one of them fitted with a Trayner-Reinhart cylinder carrier, transport 16" cylinders of ammonia—twelve at a time—from production to warehouse and from warehouse to shipment. Trucks load cylinders directly into boxcars, or onto highway trucks.

Cartons of finished chemical products are handled in pallet loads to save manual handling in transporting, storing, and car or truck loading.



The remaining trucks speed handling of chemical products in bags or cartons on pallets—taking them from production to storage, where they are high-tiered to conserve floor space, and from storage to shipment, where further man-hour savings are made in loading.

Prior to the installation of the Baker Trucks, material was transported manually and hand-stacked. Cylinders were rolled by hand, one at a time. The use of the trucks has resulted in savings of thousands of dollars annually over former methods.

BAKER INDUSTRIAL TRUCK DIVISION
of The Baker-Raulang Company
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In Canada: Railway & Power Engineering Corp., Ltd.

Baker INDUSTRIAL TRUCKS

Isotopes for Industry

(*Continued from Page 75*)

but further refinements are expected to improve this to one-millionth of an inch. Inasmuch as no mechanical contact with the film is needed, the method is admirably suited to the measurement of soft materials.

The exceptional steadiness of the radiation from carbon 14 has been mentioned. This of course is a prime requirement in any sort of gage, as it eliminates the necessity for frequent calibration. The property is due to the very long "half life" of carbon 14, which is 5100 years. Half life is the period of time required for the radioactivity to drop to one-half of its intensity at the beginning of the period. Because it takes 5100 years for the radiation intensity of carbon 14 to drop 50 per cent it will be appreciated that the intensity does not change noticeably during the lifetime of a thickness measuring gage. By the same token, this low activity means extremely weak radiation.

Many radioisotopes have differing half lives, some less than a second, others hours or days. Rate of radiation from such materials changes rapidly, inasmuch as at the end of each half life the intensity has diminished 50 per cent. Such materials, while unsuitable for accurate gages, have high value for other purposes where good intensity is wanted for a short time after which the radioactivity would be a detriment. Tracer applications can readily use materials of this type.

In studying steelmaking reactions and other metallurgical processes radioactive tracer techniques are opening up new horizons. The radioactive atoms reveal their presence unmistakably and retain their radioactivity—except for their inherent rate of decay as measured by half life—through all kinds of physical and chemical changes. They are therefore being used to investigate such problems as the removal of sulphur from iron, where knowledge is needed concerning the mechanism whereby sulphur is distributed between slag and metal. Other studies include the aging of ferrous metals by following the diffusion of carbon atoms, absorption of gases by metals, crystallization, grain-size change in the presence of contaminants, blue brittleness and temper brittleness.

All kinds of surface phenomena can be investigated with radioisotopes used as tracers. The mechanism of surface sweating, the action of detergents, cleaning processes, absorption, lubrication, are among

problems under study. Internal combustion engine friction and wear are being analyzed by using radioactive isotopes of iron and chromium on the surface of piston rings. How much material is worn off one surface, and where it goes, can be detected by applying photographic film to the cylinder of the engine after a wear test. Corrosion studies, of course, are a "natural" for the application of tracer techniques.

Three types of radiation have been mentioned and applications of two of them, the beta and gamma, discussed. The other type, the alpha particles, are high-speed ionized helium atoms (actually the nuclei of helium atoms). Among the uses for this type of radiation is the neutralization of electrostatic charges on machinery.

Present source of radioisotopes is the chain-reacting pile at the Oak Ridge National Laboratory, Fig. 1. Constructed as a pilot plant for the huge plutonium works at Hanford, Wash., the pile uses as raw material natural uranium in the presence of a moderator (graphite). The moderator slows down the fast neutrons escaping from the radioactive isotope uranium 235 (which is present in natural uranium to the extent of 0.7 per cent) thus increasing their effectiveness. Collision between a neutron and the nucleus of a uranium 238 atom (the nonradioactive component of natural uranium) results in fission which produces further free neutrons making possible a chain reaction. The end result of this process is the new radioactive element plutonium, plus intense radiation. In the Oak Ridge pile the radiation is directed against whatever materials are placed in the pile, the plutonium being regarded as a by-product.

Up to the present at least 31 elements have been exposed to radiation in this pile and above 100 isotopes produced. When a material is thus bombarded by neutrons several important effects occur. The atoms may absorb neutrons, yielding a radioactive isotope of the parent element. When this happens the atomic weight is increased but the atomic number which determines the chemical behavior remains unchanged. Atomic number is the number of positive charges on the nucleus and also the number of electrons in the orbits surrounding the nucleus. For example, ordinary phosphorus (atomic weight 31) by neutron absorption becomes radioactive phosphorus 32.

Another important effect is transmutation which yields radioisotopes differing chemically from their parents. When this happens the

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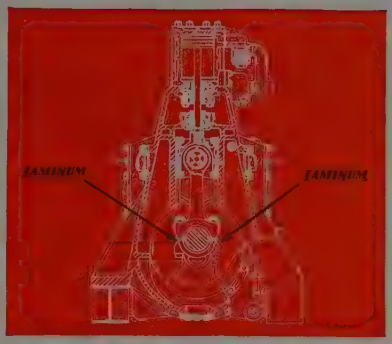

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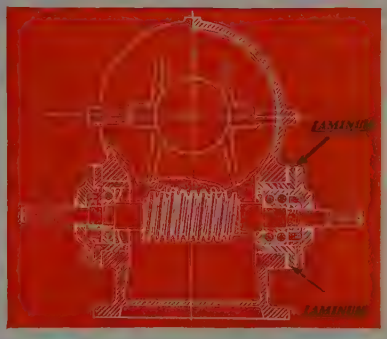
FOR SPLIT BEARINGS

FOR RING AND PINION MESHING



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4. No dirt, oil, grease between shim layers.
5. Harder than stacked or ordinary one-piece shims.
6. Your customer recognizes LAMINUM shims as a plus in maintenance.

Send today for chart illustrating 46 money-saving, time-saving applications, detailed specifications, sample of LAMINUM.

PRECISION STAMPINGS in any quantity

Let us quote on your *difficult* stamping jobs. Our experience, tools and presses are geared for *close tolerance* production.

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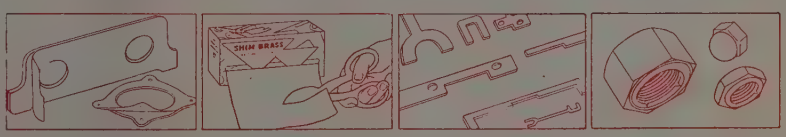
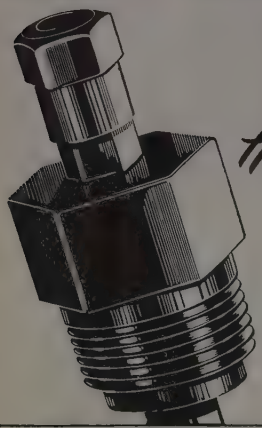


SHIMS SHIM STOCK STAMPINGS AN-COR-LOX NUTS

OIL STANDBY EQUIPMENT

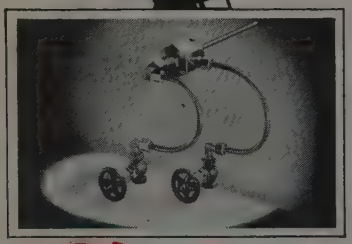
INSURES AGAINST PLANT SHUTDOWNS

DUE TO WINTER FUEL SHORTAGES!



Hurry! **Present demand dictates a limit on deliveries for installation this fall.**

● During the winter season of 1947, 'Surface' installed oil standby equipment in a total of 159 furnaces — 1100 burners, of 'Surface' design, which operated almost daily in one instance for a 58-day period. 61 users enthusiastically recommend this equipment to insure constant plant operation—maintain production—build employee relations and create customer goodwill.



ACT QUICKLY!— the demand for this new oil standby equipment is rapidly absorbing available production facilities.

EASY TO INSTALL— *change over from one fuel to the other is a matter of seconds for most installations.*

SURFACE COMBUSTION CORPORATION
TOLEDO 1, OHIO

'Surface' INDUSTRIAL BURNERS AND FURNACES

ATTACH THIS COUPON TO YOUR LETTERHEAD AND MAIL

☐ RUSH 8-page bulletin giving specifications and engineering details.
☐ Glad to have your engineer determine our requirements.

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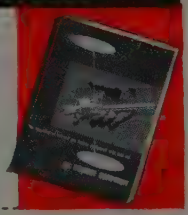


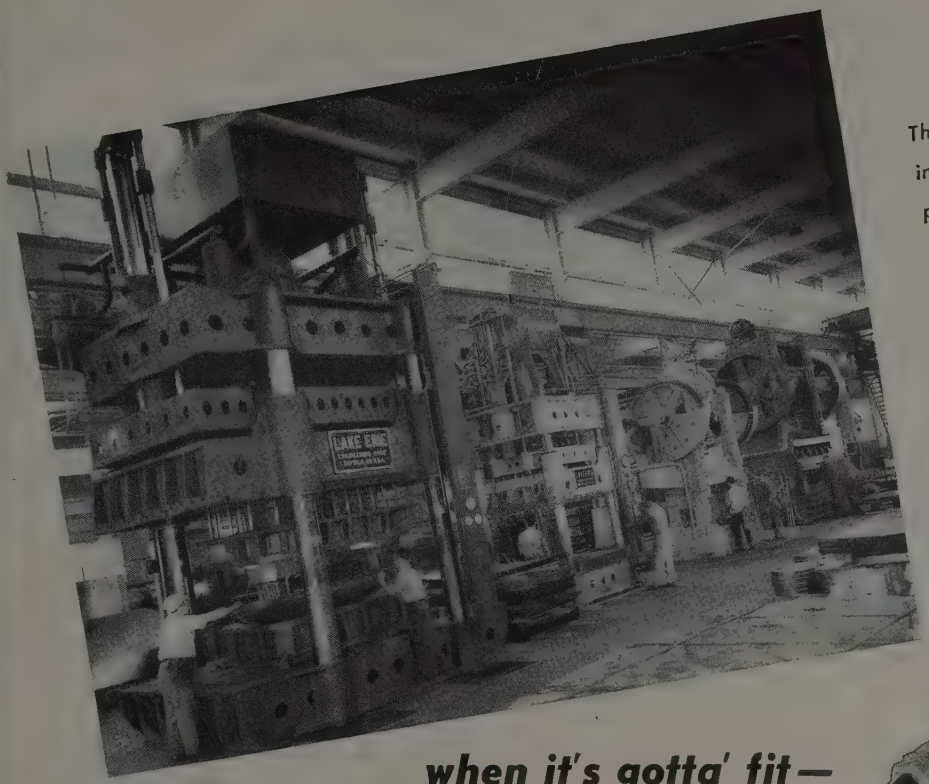
atomic weight is unchanged but the atomic number changes due to a change in the positive charge on the nucleus. For example, ordinary sulphur (atomic weight 32) by transmutation becomes radioactive phosphorus 32. The atomic number, however, changes from 16 to 15 due to the loss of a positive charge. Being unstable, the phosphorus 32 decays or degenerates back to sulphur 32, releasing radiation in the process.

A third possible effect is neutron absorption followed by a decay chain yielding radioactive "daughters" which are not isotopes of the original element. For example, uranium 238 in the chain-reacting pile is converted to the fissionable daughter plutonium 239. It is therefore called a "fertile" isotope. This ability to "breed" fuels has important implications in connection with development of atomic power. It means that it may be possible to produce more "fuel" than is consumed. Thus the relatively abundant uranium 238 and thorium 232, significant deposits of which exist in the continental United States, may themselves be used as fuels as well as the scarcer uranium 235.

In addition to the radioisotopes so far discussed, many uses are being found for stable isotopes, such as heavy water, which exist in nature in relatively small concentrations along with the commoner isotopes. Separation of these rarer isotopes on a much larger scale than hitherto is now possible as a result of the atomic energy program. Among other methods one of the electromagnetic separators at Oak Ridge is now being used for the production of stable isotopes. Such isotopes represent approximately 10 per cent of the total shipments of isotopes to date.

In the two years since the Atomic Energy Commission started distributing isotopes from the Oak Ridge division about 3500 shipments have been made to hospitals, universities and other research centers, and to industry. Of this total some 131 shipments were for industrial and metallurgical research. The commission publishes catalogs and price lists covering available isotopes. Information service on the techniques and uses of isotopes also is maintained. In addition to selling isotopes produced in the pile, the isotopes branch also undertakes to irradiate material furnished to them. All indications point to an accelerating demand for isotopes and for irradiation service. So far the surface has barely been scratched and it is safe to predict that ultimately the benefits to be derived will reach into every corner of industry.

GIANTS THAT WORK AT BRANDT



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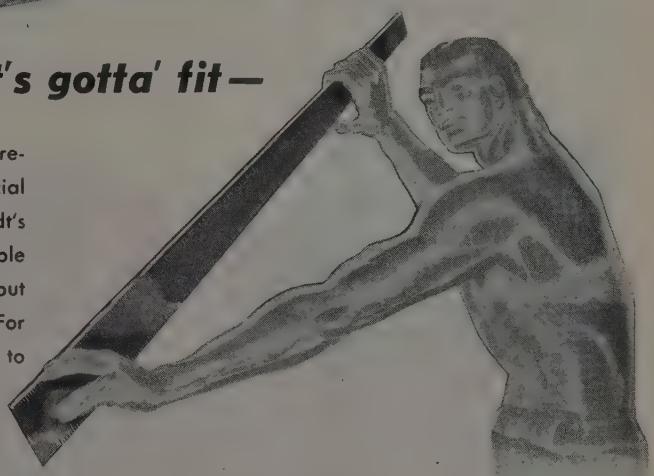

BRANDT BALTIMORE *Measures up*

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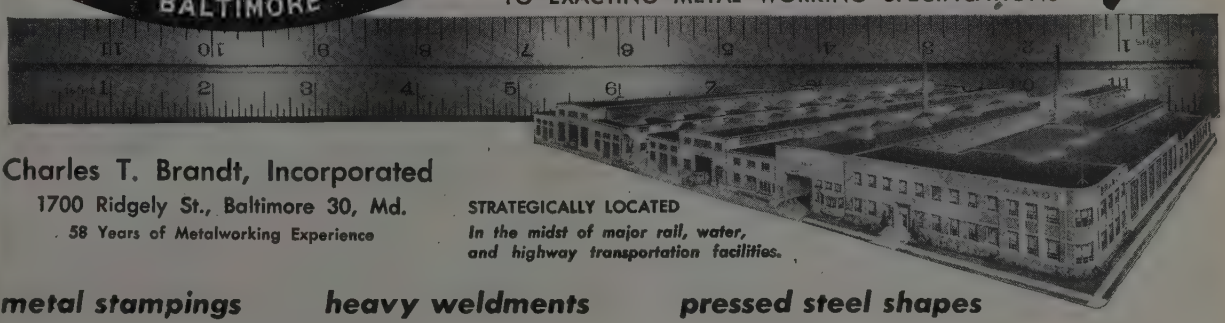

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In the midst of major rail, water, and highway transportation facilities.

metal stampings ***heavy weldments*** ***pressed steel shapes***

Furnace Brazing

(*Concluded from Page* 84)

brazing, is the brazing of stainless steels and other high-chromium alloys without flux, in highly-purified protective atmospheres. Although the technique has been used for some time in laboratories, it is only recently that it has become appreciated production-wise. As a result, several batch-type furnaces are now in use on this class of work. Also, some furnaces are successfully brazing stainless steels with flux in ordinary atmospheres.

In such cases, flux deposits must be removed after brazing and the green chrome oxide must be pickled off the surfaces of the brazed parts. With the new technique, however, no flux is required and copper wets and creeps over the surfaces of the high-chromium alloys as well and freely as on low-carbon steel under ordinary conditons. The surfaces are bright and clean, requiring no subsequent cleaning operations.

Fig. 9 shows a typical 18-8 stainless steel assembly, copper brazed by the new technique. This consists in part of a piece of 4¼-inch diameter seamless tubing counterbored at one end to form a shoulder to support a thin disk punched from 1/16-inch stock. The tube is sized inside at the opposite end and turned on the outside to provide an accurate fit into a groove in the base plate which is cut from ⅜-inch sheet stock. Copper-wire rings are placed at the joints, after assembling.

A number of the prepared assemblies are loaded into a sheet-metal retort, provided with gas inlet and outlet tubes. The work is supported on a tray having a powder seal around its edges, and a box-like cover is placed over the work resting in the seal. This arrangement completely isolates the work in its container from the protective atmosphere which will surround the container within the furnace. The container is then purged with pure, dry hydrogen or dissociated ammonia, following which it is charged into the heating chamber for the brazing cycle.

Then the retort goes to the cooling chamber. Pure gas is fed to the retort throughout the cycle, but just before removal from the cooling chamber the retort is usually purged with nitrogen for safety. Although this method is obviously a little slower and more expensive than ordinary furnace-brazing procedure, these handicaps are offset by the elimination of cleaning operations, uniform ductility or hardness of the assemblies, and the assurance that there will be no unwanted foreign particles in inaccessible parts. The same technique is used for bright annealing, for sintering and for heat treating air-hardening stainless steels, with equal success. Sometimes one of these treatments is combined with copper-brazing; this constitutes both brazing and annealing, or brazing and hardening, in one operation, depending upon the type of material used.

Use of Solid Carbide Reduces Feed Roll Wear

Ten times longer service between reconditioning grinds has resulted from use of solid carbide feed rolls in an automatic screw machine operating at Carboloy Co. Inc., Detroit.

Previous rolls in the pressure feeding apparatus had to be reconditioned after an average of 4700 linear feet of steel rods had been run. Solid carbide rolls had not been reconditioned and showed no appreciable wear after 50,300 feet of steel had moved through them in a year's time.

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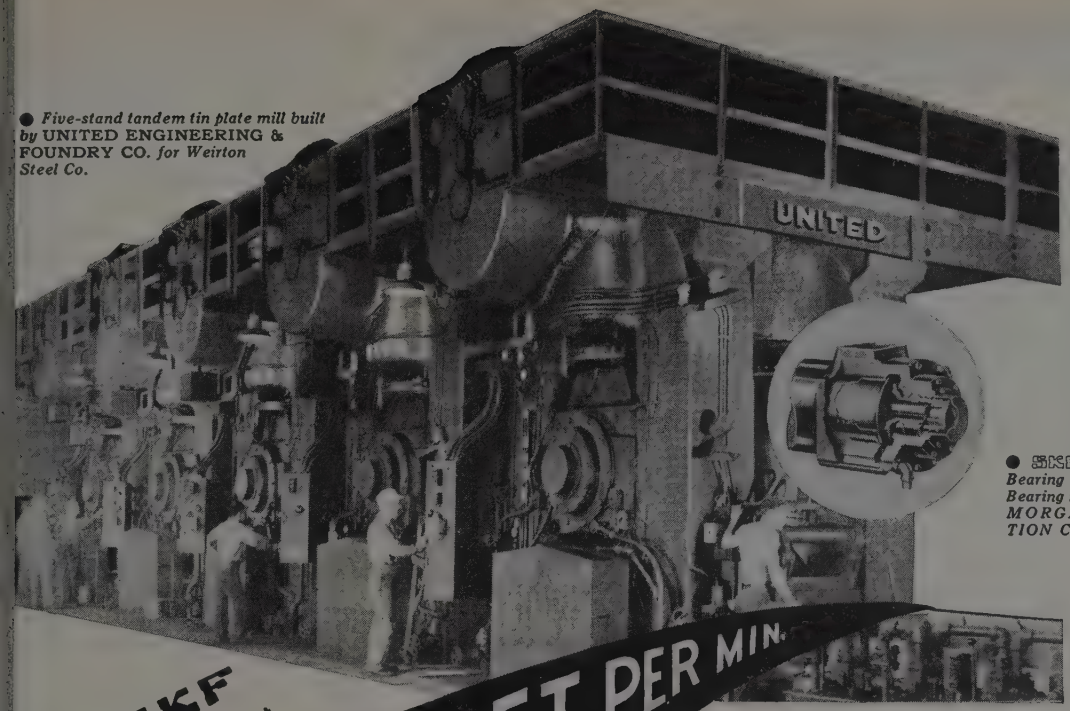

● *Five-stand tandem tin plate mill built by* UNITED ENGINEERING & FOUNDRY CO. *for Weirton Steel Co.*

● SKF *Back-Up Thrust Bearing in the MORGOIL Bearing manufactured by the MORGAN CONSTRUCTION CO.*

It's SKF *for Thrust at*

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AT THE WEIRTON STEEL COMPANY

SKF's double directional adaptation of the spherical roller thrust bearing is used in the MORGOIL Bearings on the *back-up rolls* of Weirton's "mile-a-minute cold mills." Combining high thrust capacity and rolling alignment with the ability to run at sustained high speeds, the SKF Spherical Roller Thrust Bearing is the logical choice for hot mills and high-speed cold mills.

With the back-up roll thrust problem solved for speeds of even 10,000 feet per minute, SKF is now offering a companion bearing to replace troublesome conventional *work roll* mountings. This mounting can be effectively lubricated with grease.

Also in the less spectacular but equally important *auxiliary equipment*—drives, pinion stands, cranes, cleaning lines, tin lines, etc.—the choice of SKF Bearings means the right bearings in the right places for continuous, trouble-free performance. 6463

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SPHERICAL ROLLER BEARINGS

NEWCOMB-DETROIT Radiant Oven *Improves* Auto Finishes

Newcomb-Detroit engineered, built and installed this oven for one of the Detroit automobile manufacturers over two years ago. Burdette radiant-type burners were used throughout.

Drying time is cut from 45 minutes to 19 to 22 minutes on each of three coats while fuel costs are reduced 8%. But most important to the auto manufacturer was the fact that the finishes are harder, more durable in all types of weather and even the most delicate colors are held uniformly. In addition, these burners bring the oven to heat almost immediately which eliminates the 2-hour *warm-up* period formerly required.

The oven shown is one of several for auto bodies. However, Newcomb-Detroit also installed radiant gas ovens for fenders, hoods and other parts that make up the entire finishing system.

This is typical efficiency for Newcomb-Detroit installations for all types of finishing. Our engineers are at your disposal to discuss your finishing problems. Write today.

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Main Office and Plant **DETROIT 11, MICH.**
Western Sales **CHICAGO 5, ILL.**

Iron Tonnage

(*Continued from Page* 98)

Table III, shows the coke oven data, such as coal mixture, percentage of furnace, domestic and braize coke produced, per cent ash in the furnace coke, strength of the coke as measured by the tumbler stability +1 inch and hardness +¼-inch factors, and the furnace data—tons of iron produced per day, coke consumed per ton of iron and the wind blown before and during the period when weathered Pocahontas coal was used in the blend.

Braize production increased from 5.5 per cent average for August and September to 6 per cent in October, 7.1 per cent in November, and a high of 9.2 per cent for the period December 1st to 20th. There was a decrease in braize production to 7.4 per cent during the period December 21st to 31st. In January the braize production was back to normal—5.5 per cent.

There was very little change in the percentage of domestic coke produced. Strength of the coke, tumbler stability +1 inch and hardness +¼-inch factors decreased, starting with October, and continued through December 20th. There was an improvement in coke strength in the December 20th to 31st and the January periods, indicating that we were out of the weathered low volatile coal.

On the blast furnace there was a decided drop in iron production and the amount of wind that could be blown, starting with November and continuing through the December 20th period. There was an improvement in iron production and wind blown in the period of December 21st to 31st. In January iron production averaged 1067 tons per day as compared with 1094 tons averaged for August and September.

In charts Nos. 3 and 4 we have set up the data in Table III in the form of curves to show effect of charging weathered low volatile coal on coke quality and iron production.

Chart No. 3 shows percentage of Pocahontas coal used in the mixture and the yield of furnace, domestic and braize coke. As the percentage of Pocahontas in the blend was increased from 25 to 35 from October to December, yield of furnace coke decreased and amount of braize increased. The yield of domestic coke remained about the same.

Chart No. 4 shows how the stability and hardness factors of the furnace coke correlate with iron production

on "B" furnace. The decrease in the stability and hardness values of the coke follows the downward trend of the iron production curve.

In order to compare the effect of the quality of coke on iron tonnage, selected coal blends were carbonized under identical oven operating procedures, and the resulting furnace cokes were used in succeeding tests on one furnace, where operations were maintained as uniformly as possible, so that iron production would be indicative of coke quality.

Furnace tests showed that No. 2 and No. 3 blends produced satisfactory cokes, comparable in physical properties and in furnace performance. In other words, we have found in our test work, to date, that coke approximating the following physical properties afforded us our best blast furnace operations:

Per cent Ash in Coke	7.0
Average Size of Coke	2.18-2.19 in.
+ 2 in. Coke	53-55 per cent
Shatter Test + 2 in.	51-53 per cent
Tumbler Stability	47-49 per cent
Tumbler Hardness	67-69 per cent
Porosity	51-53 per cent

Substitution of Jenkin-Jones for our No. 3 Pocahontas produced smaller coke with lower shatter and stability indices than was obtained from our Inland blend. Iron production was also lower.

When 25 per cent Illinois coal substituted for some of our No. 3 Elkhorn seam Wheelwright coal, the coke properties were again altered. The size, shatter index and porosity were increased. Tumbler stability remained the same, but tumbler hardness was definitely lower. The coke was dark and rough in appearance. Iron production was lower than from the 35 per cent No. 3 Pocahontas-65 per cent Wheelwright blend. Coke consumption was greater due to higher ash content of the Illinois coal.

When the coal blend consists of miscellaneous low and high volatile coals with extreme variations in expansion characteristics and a higher ash content, as in the mixture used at our Plant No. 3, we produce coke that is larger in size and has lower tumbler stability and hardness values. Use of this type of coke lowers the efficiency of the blast furnace.

When weathered Pocahontas coal is included in the blend, we found that the coke produced contained an excessive amount of braize. In addition, the coke had definitely lower tumbler stability and hardness factors. When this poor quality coke was charged to the blast furnace, there was a decided decrease in the amount of wind blown and in iron production.

From paper presented before American Iron & Steel Institute, New York, May 26-27, 1948.

Tumbling barrels completely fabricated by Ampco Metal, Inc. of Ampco-8 sheet, welded with Ampco-Trode corrosion-resistant arc welding electrodes. Studs are welded to base of barrels for mounting on tumbling turntable.
Ampco Metal
makes tumbler-barrel costs tumble

Using Ampco rolled sheet cuts maintenance and replacements

Tumbling barrels are used to clean rivets, screws, nuts, and a variety of similar small parts. Formerly, they wore out quickly—because of the cleaning solution's corrosive action, and the abrasive effect of swirling metal parts. Replacement costs were high, until the manufacturers switched to tumbling barrels fabricated with Ampco-8 sheet. This durable, corrosion-resistant alloy solved their expensive replacement problem in jig-time.

That is just one more case of the money-saving value of Ampco Metal's unique physical properties. Hundreds of companies use durable Ampco Metal and Ampcoloys in their own products as selling features—and in their production equipment as insurance against heavy maintenance and replacement costs on parts subject to wear.

Call in your nearby Ampco engineer for cost-cutting suggestions. Write for complete information on Ampco castings, extrusions, forgings, sheet, and fabricating service.

Ampco Metal, Inc.

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New Books

Accounting Guide for Drop Forging Industry

Accounting Handbook for the Drop Forging Industry, by George A. Ware, 3544 Ingleside Rd., Cleveland 22; published by the author for $6.

Written for the guidance of executives and accountants in the drop forging industry, this handbook has been approved by the members of the Drop Forging Association's accounting committee. In addition to its specific application to this industry, however, the principles and procedures outlined can be applied to other metalworking industries.

Included is a complete chart of accounts for the general drop forging plant with a definition of each account. Manufacturing expense distribution is covered in great detail and the determination of actual and of normal burden rates is discussed at length and fully illustrated. A section is devoted to appraisal methods and depreciation, with suggested forms for the appraisal procedure included. Forms for equipment ledger records are also shown. Other topics which are discussed and illustrated include estimating for customers, job costing and die costing methods, comparison of completed order costs, forge shop production reports and financial statements.

Management Booklets Offered by Association

Published by American Management Association are three groups of booklets divided into three series —Personnel, office management and production. All of the booklets have cloth covers, measure 6 x 9 inches and cost 75 cents, unless otherwise noted. Booklets and their subjects are as follows:

Personnel series, No. 114, *Plant-Wide and Geographical Salary Administration.* Subjects include U. S. steel wage classification program, salary administration for exempt personnel, geographic factors in job pricing. No. 118, *Trends in Employee Health and Pension Plans;* subjects —Union interest in retirement plans, methods of funding pension plans, health insurance plans. No. 119, *Planning Wage and Extra Compensation Policies;* subjects—Simplifying the wage structure, supplementary compensation plans, case for profit sharing, wages and the economic outlook.

Office Management Series, No. 119, *New Horizon in Office Management;* subjects — Are managers people?, management training for supervisors. No. 121, *Incentives and Standards in Office Production,* 50 cents; subjects—incentives that produce results, effective work simplification.

Production Series, No. 172, *Planning and Administering Effective Incentives;* subjects—Why work?, Adamson's profit-sharing plan, group incentives, work simplification and the human equation. No. 174, *How To Develop Competent Supervision;* subjects—Selecting and rating the supervisor, supervisory development, one million management spokesmen. No. 175, *Labor-Management Co-Operation for Increased Productivity,* $1.00; subjects—Joint development of standards, plant-wide incentives, merit rating in a job shop; the human factor in production.

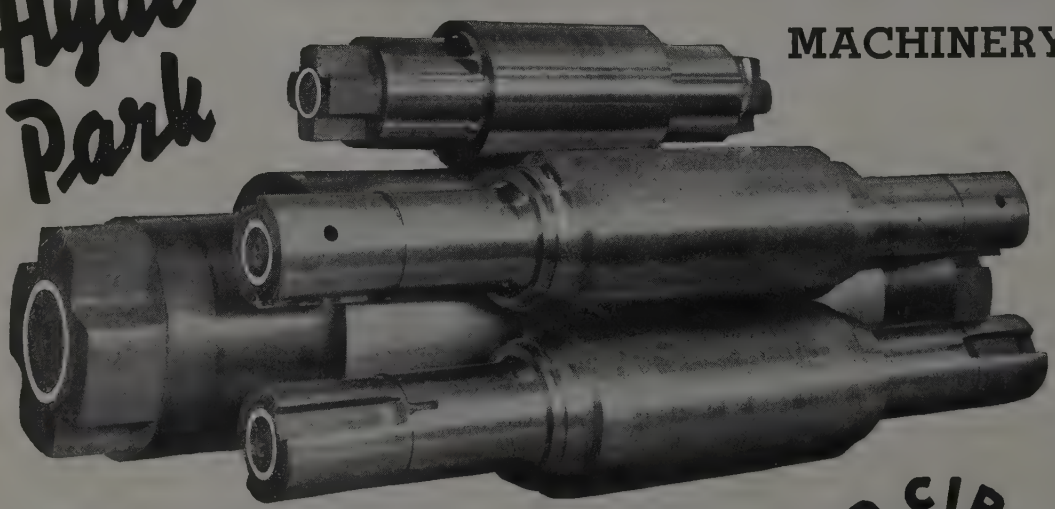
—o—

CORRECTION

Publisher of the statistical yearbook reviewed on page 126 of the September 6, 1948 issue of STEEL is the British Iron & Steel Federation, not the British Iron & Steel Institute, to whom the credit was given.

Hyde Park

CHILLED ROLLS and ROLLING MILL MACHINERY



This may be the Atomic Age, but in practice it is still the Steel Age—and one of the constant demands of this age is rolled steel products. To those who juggle rolled steel against prices and markets, superior equipment is frequently the difference between profit and loss. The Hyde Park Foundry and Machine Co. is equipped to design and manufacture individual chilled rolls or complete rolling mill units. Their accumulated knowledge of rolls, rolling mill machinery and procedure is available to all who inquire. Free consultation is part of our practice; you should take advantage of it.

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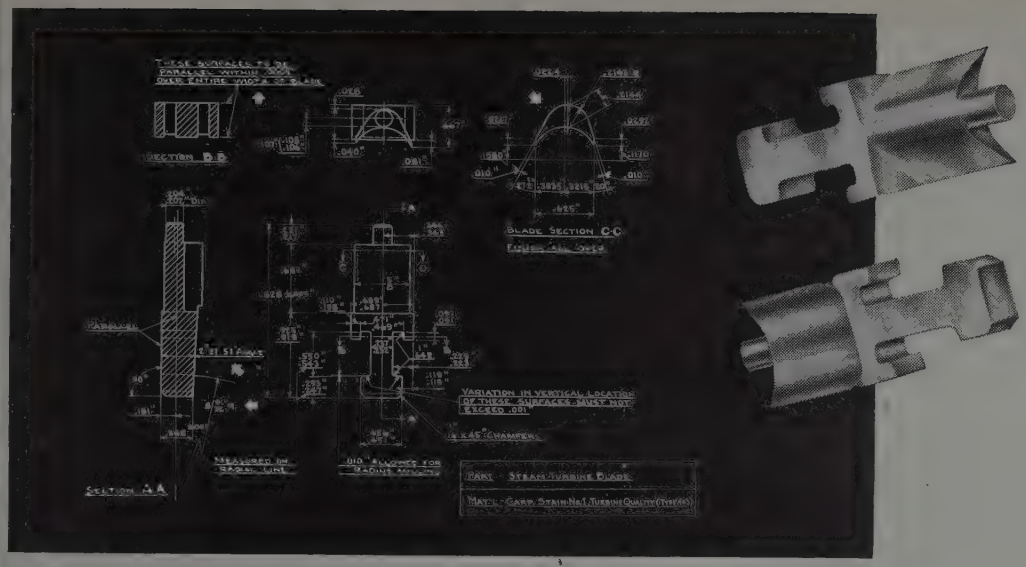

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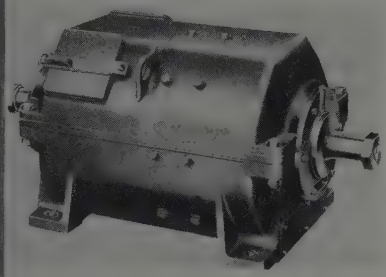
Alliance

Mill Motor

Adaptable for use totally enclosed nonventilated or separately ventilated, the 600 series direct current steel mill motor, announced by Crocker-Wheeler Electric Mfg. Co., Ampere, N. J., has shortened bearing housings and careful proportioning of field pole design. Self-ventilated motors are cooled by a fan mounted at the



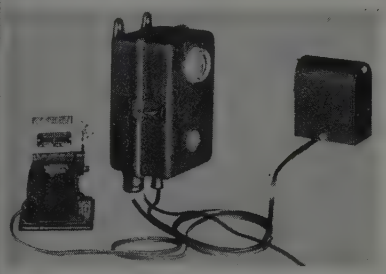
rear of the armature. In the totally enclosed nonventilated motors, the fan action is provided by the back ends of the coil supports.

Grease slingers and grooves keep grease and dust away from commutator and windings. Bearing caps are removable to facilitate bearing inspections. The solid cylindrical roller bearings are completely supported against thrust and radial loads. Improved commutation is provided by split brushes and four interpoles. The coils have extra support against vibration.

Check No. 1 on Reply Card for more Details

Photoelectric Counter

Designed for installation on any conveyor system or automatic machine, the type 20AP5 photoelectric counter, made by Photoswitch Inc., 77 Broadway, Cambridge 42, Mass.,



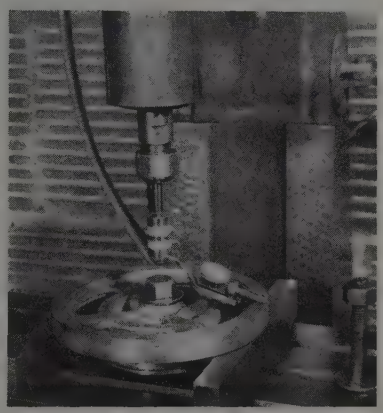
is capable of up to 600 counts per minute. Operating range may be up to 6 feet between photoelectric unit and light source. The light source has an adjustable lens which permits narrowing down the light beam for counting very small objects.

One or more electric counters containing the counting face and reset knob may be located anywhere in the plant, remote from the location where the count is being made. After reaching the maximum number of 99,999, the counter returns to zero, or it may be reset with the reset knob. Operation is from a 115 volt, 60 cycle alternating current light outlet.

Check No. 2 on Reply Card for more Details

Indicator Holder

Set-up checking and inspection may be speeded up with the universal dial indicator holder, developed by Phillips Bros. Screw Products Co., 125 South Howard Ave., Lansing 12, Mich. The device, which makes dial



indicators more convenient to handle and extends their utility, can be used in jig borers, milling machines and boring mills.

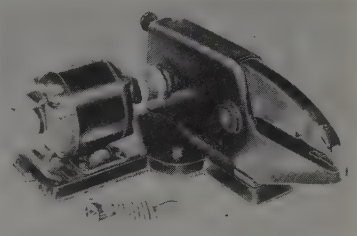
Holder may be used with Last Word model F, Gem, Federal, Ideal, Brown & Sharpe and Gladwin indicators. The holder is universal, the indicator holding arm turning 360 degrees and swinging 90 degrees either side of center. Its shank is drilled for an extension.

Check No. 3 on Reply Card for more Details

High Speed Shear

Designed with an unusually small head and base to permit a wide variation in work shapes, the Grampus high speed shear, distributed by Federal Machinery Co., 134 Grand St., New York 13, N. Y., can be used for straight and contour cutting by means of a locking device. Material of almost any odd shape can be placed over the head or under the base for quick, burr-free cutting. No starting hole is required for inside work.

Rated up to and including 14-gage mild steel, the shear's stroke is finger tip controlled and rapidly adjusted. Pipe work, pans, channels, tubes, etc., of various diameters may be



handled within the limits of its 7-inch throat. Powered by a ¼-horsepower motor, the 100 pound unit has a direct coupling drive.

Check No. 4 on Reply Card for more Details

Trolley Conveyor

Smith Power Transmission Co., 1545 East 23rd St., Cleveland, O., is announcing its FlexoiD overhead cable type trolley conveyor of light, rugged construction. Its roller chain type driving sprocket permits trolley spacing to 1¼-inch increments.

Trolleys are cast split design to eliminate threading on cable. Ease in adding, removing or changing centers of trolleys is also facilitated by this design. Maximum load per trolley is 100 pounds. The conveyor will operate in horizontal plane, 45 degree maximum, rise or dip in a vertical plane.

Check No. 5 on Reply Card for more Details

Dust Remover

Stainless steel used in the construction of the 30,000 cubic feet per minute Centri-Merge swirl type arrester, made by Schmieg Industries Inc., 298 Piquette Ave., Detroit 2, Mich., guar-

antees longer, corrosion-free operation, with a minimum of maintenance costs.

Used to remove dust and dirt from shakeout stations, sand handling and

conditioning systems, the unit's sludge disposal is by a skid on a lift truck. The conveyor drive is on top of the conveyor spout of the machine, which is compactly built to economize on floor space.

Check No. 6 on Reply Card for more Details

Punch Press Guard

Air and electrically operated, the model A-E No. 100 punch press guard, made by Graham Specialty Co., 12925 Auburn, Detroit 23, Mich., is designed for any size of inclinable, direct clutch press that does not require more than 150 pounds pull to operate its foot trip. The foot treadle is replaced by an Air Thruster and a set of pushbuttons for each

operator is installed, the buttons located far enough apart so that the operator must use one hand on each button.

An antirepeat switch will allow the ram to descend only once, unless the solenoid valve is re-energized by use of the two start buttons. A foot attachment for the handling of long stock may be furnished. Plugging it into the press for blanking purposes gives an automatic operation to the press, making the pushbuttons inactive.

Microlimit switches can be installed in the circuit on interlocking dies so that the press cannot be operated unless the die or work is in the home position.

Check No. 7 on Reply Card for more Details

Collet Chuck

Modification of the quick collet chuck made by Goodwin Mfg. Co., Cuyahoga Falls 20, O., adapts it for use with any standard electric motor to perform such secondary operations as deburring, filing and polishing. Conversion is accomplished by addition of a shaft adapter and adjustable stop. A spring ejector can be provided to speed production work.

Chuck body is made in two parts to facilitate accurate mounting and will run true on the motor shaft without wobble. Models can be furnished with either straight holes or tapered holes.

Positive gripping is supplied by actuation of a small control lever. Threaded nose cap is easily removed

for changing collets. Chucks are offered in two sizes: The 1-inch capacity model fits motors having up to 1½-inch shaft diameter; the 2-inch capacity model fits any shaft up to 3⅜-inch diameter.

Check No. 8 on Reply Card for more Details

Sheet Feeding Table

With a 10,000 pound capacity and a 16-inch range of elevation, the sheet feeding table model 66, made by Lyon-Raymond Corp., 6276 Madison St., Greene, N. Y., has a 36 x 66 inch table, which with extensions can be increased in size to 48 x 96 inches. Table has a lowered height of 26

inches and an elevated height of 42 inches.

It is portable and can be loaded in a storage area and maneuvered into place by an industrial power truck. Two 8-inch swivel casters with Timken bearings provide easy steering. The two rear wheels are 10 inches in diameter and are equipped with ball bearings. Equipment includes a two-speed foot pump with 5 feet of hydraulic hose. A floor lock is provided. Photograph shows table equipped with an optional ¾-horsepower motor that is driven by a pump with foot-operated switch.

Check No. 9 on Reply Card for more Details

Solenoid Valve

Hanna Engineering Corp., Chicago, Ill., is announcing a small, balanced spool type of 4-way solenoid valve with a manifold design which permits lines to be connected to bottom, sides or a combination of both, as desired. Three point mounting pads are provided to prevent distortion of parts. It is adaptable to straight line piping, with valve capacity equal to rated pipe size.

Valves and manifolds are interchangeable and the valve proper may

be removed from the manifold without disconnecting pipe lines. Solenoids may be replaced without severing wiring connections if a cord with pin plug is used. Valve proper is made of corrosion resistant materials.

Check No. 10 on Reply Card for more Details

Honing Machine

Rapid, accurate honing may be performed on any type of internal cylinder ranging from 1/2 to 4 inches on the model 412 vertical hydraulic honing machine announced by C. Allen Fulmer Co., First National Bank Bldg., Cincinnati 2, O. The machine has a maximum honing stroke of 12 inches. Reciprocation is by means of a hydraulic cylinder, allowing any reciprocating speed from 0 to 80 feet per minute, regardless of the length of stroke setting.

Hydraulic power is supplied by a Vickers vane pump driven by a 3

"Electro" serves:

METAL AND CERAMIC INDUSTRIES
Non-Ferrous and Ferrous Foundries; Steel Mills and Smelters; Brass Rolling Mills; Heat Treaters and Annealers; Potteries; Art Potteries; Grinding Wheel; Sanitary Ware; Floor and Wall Tile; Electrical Porcelain; and miscellaneous Ceramic Plants.

THE AUTOMOTIVE, CHEMICAL, SHIPBUILDING
and Utilities Industries as well as Federal, State and Municipal Agencies.

with

1 ABRASIVE WHEELS

Abrasive Wheels—Resin-bonded, High-Speed Grinding Wheels to cover nearly every conceivable use from snagging and cutting operations to fine precision grinding.

2 CRUCIBLES

Crucibles, (Tercod-Conqueror) Pedestal Blocks and Pot Lids—The Carbon-bonded Crucible for melting aluminum—nickel—copper—the brasses and bronzes—zinc—silver—gold—iron, using any fuel: oil, gas, coke or coal, electricity.

3 REFRACTORIES

Special Refractories—Electric furnace refractories of all kinds used for:

Ceramic Kiln Furniture—Slabs and Posts for rigid, floating or semi-floating open construction; plate setters, tile setters, sanitary ware setters and silicon carbide saggers.

Muffles and Hearths—One piece and sectional for enameling furnaces, tunnel kilns, assay and heat treating furnaces, pottery kilns.

Crucible Furniture—Linings, covers.

Pyrometer Tubes—And tubes for other purposes.

Brick—9" series or special shapes to individual specifications.

Burner Blocks—And for electric furnace door blocks, door frames, port blocks and electrode sleeves.

Stopper Heads—For steel ladles; also slag hole and tap hole blocks for Cupolas.

4 CEMENTS

Cements and Ramming Compositions—Of special refractories used by all industries; monolithic linings for electric, gas and oil furnaces; patching furnace walls, laying brick, boiler setting and ladle linings.

5 ALLOYS

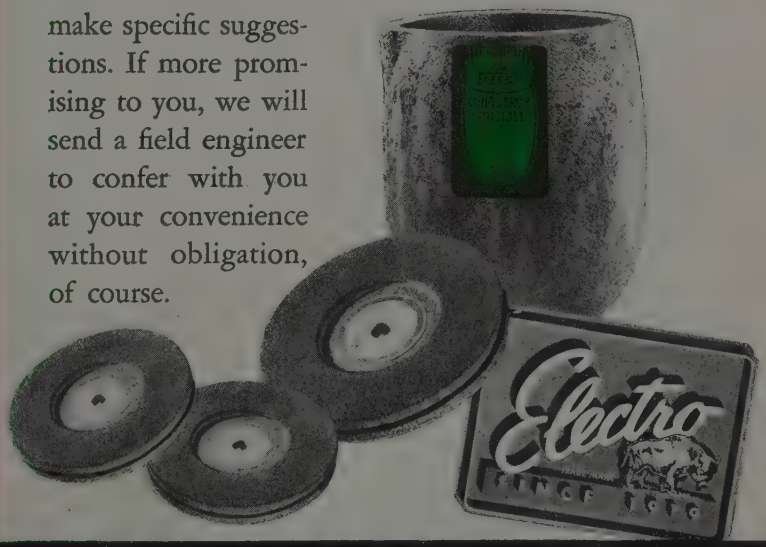
ALLOYS—Special compositions for additions, deoxidation, degasification, purification: Copper—Aluminum—Chromium—Titanium—Nickel—Silicon—Magnesium—Iron—Lithium—Calcium—Calcium Boride—Tin—Zinc—Lead.

...IF YOURS IS AN *Exacting* INDUSTRY

LET THIS CHECK LIST GUIDE YOU TO RELIABLE NEW SOURCES

- ✓ ABRASIVE WHEELS
- ✓ CRUCIBLES and REFRACTORIES
- ✓ CEMENTS and ALLOYS

VOLUME is as attractive to us as to any industrialist. But because we elected to supply, in addition to standardized items, products and services outside the capacities of mass-producing suppliers, our volume results cumulatively on many specialties. Therefore, if the kind of product you require is not apparently available, we have, in all probability, what you want in our regular line. If not, perhaps we can re-engineer or originate needed items to your special requirements. Let our product list at the left serve as a general index to the possibilities and then write us in enough detail to allow us to make specific suggestions. If more promising to you, we will send a field engineer to confer with you at your convenience without obligation, of course.



Electro Refractories & Alloys Corporation

344 DELAWARE AVE. BUFFALO 2, N. Y.

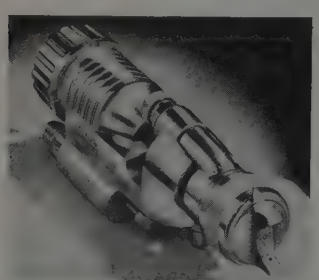
horsepower motor. The spindle is driven by a separate 3 horsepower motor. It has three spindle speeds, obtained through the use of cone pulleys and a V-belt, with the output pulley driving a set of alloy steel reduction gears. Working table is 18 x

24 inches, with T-slots for ⅝-inch bolts and is so placed that the machine can handle work pieces that are as large as 21 inches in outside diameter.

Check No. 11 on Reply Card for more Details

Spray Gun

Adaptable to any type spray finishing machine, the faster acting automatic spray gun, developed by DeVilbiss Co., 300 Phillips Ave., Toledo 1, O., is only 7 inches long and weighs but 2¾-pounds. It can be



supplied with mounting adapters that permit tipping and turning it to any conceivable position. The fast action allows the gun to open, spray and completely close 5400 times per hour.

All types of materials may be sprayed with the AGA gun. It is adaptable to the most delicate or the heaviest types of product finishing. A wide range of air caps and fluid tips are interchangeable on the gun. Minimum piston operating air pressure is 40 pounds.

Check No. 12 on Reply Card for more Details

Photocopy Machine

Four hundred 8½ x 11 inch copies per hour and copies of originals up to 18 inches wide may be made on the CP-18 Apeco continuous photocopy machine announced by American Photocopy Equipment Co., 2849 North Clark St., Chicago, Ill. Copies of records, plans, drawings, blueprints, photos, letters, etc., may be made. The machine operates on a simplified photographic principle.

Using a continuous automatic mechanism and a simplified control panel makes possible operation by untrained personnel. An original and a piece of photocopy paper are fed together into an opening. The continuous canvas belt and revolving glass cylinder keep them under constant, uniform pressure. Exposed sheets come out ready for quick, easy processing.

Check No. 13 on Reply Card for more Details

• • •

STEAM CLEANING UNIT: The improved Hydro-Steam unit announced by Turco Products Inc., Los Angeles 1, Calif., is for use wherever a steam line pressure of 80 to 150 pounds is available. The portable unit weighs 28 pounds.

Check No. 14 on Reply Card for more Details

MOTOR CAPACITOR: Designed to withstand the same physical treatment as the motor itself, a new Pyranol motor capacitor is announced by Transformer and Allied Products Division of General Electric Co., Schenectady 5, N. Y. It has bushings of silicone and the unit is completely enclosed in 10-gage steel tubing.

Check No. 15 on Reply Card for more Details

THREAD COMPOUND: Felt Products Mfg. Co., Chicago, Ill., announces Fel-Pro C-5 Hi-Temp thread compound which prevents freezing and galling of metal surfaces at temperatures as high as 1800° F. It also minimizes shut-downs or dismantling time and stops stud breakage.

Check No. 16 on Reply Card for more Details

SYNTHETIC RESINOUS TAPE: Unichrome tape 705, announced by United Chromium Inc., New York 17, N. Y., is a synthetic resinous tape that resists chemical attack, aging and insulates electrically. It is designed especially for use by electroplating industry as a coating for racks or for stop-off purposes; however, it has a wide variety of applications in other fields.

Check No. 17 on Reply Card for more Details

AUTOMATIC WEIGHER: M-118-D weighing machine automatically prints and visually indicates dormant loads with rapidity and accuracy. The unit, offered by Streeter-Amet Co., Chicago, Ill., has a capacity from 1000 to 100,000 pounds.

Check No. 18 on Reply Card for more Details

PAINT REMOVER: By inhibiting evaporation, improved Paint Lift penetrates paint thoroughly and gets it off quickly. Extremely slow evaporation makes it effective for outdoor use. Made by Kelite Products Inc., Los Angeles 54, Calif., the remover is safe on all metals, including aluminum, iron, tin and magnesium.

Check No. 19 on Reply Card for more Details

CLAMP: Model P&P-800 clamp, announced by Lapeer Mfg. Co., Lapeer, Mich., is intended to perform in places where space is limited or under circumstances where the operating handle cannot be accommodated except at a distance from point of pressure application, or where plunger must travel under load either pushing or pulling, rather than creating pressure merely at end of stroke. Clamp can exert 800 pounds pressure with normal hand operation in either push or pull movement of the handle.

Check No. 20 on Reply Card for more Details

TACHOMETER INDICATOR: Metron Instrument Co., Denver 9, Colo., announces a single range indicator, type 43, for use with any of the company's tachometer heads. The unit is shock mounted in sponge rubber to permit its use wherever severe shock or vibration is present and the aluminum housing is designed to provide flush switchboard mounting from front or bracket mounting from bottom. Directly calibrated in any units, this indicator can measure any quantity which is actuated by speeds from 1 to 100,000 revolutions per minute.

Check No. 21 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

STEEL SUPPLY— Buyers are fighting tooth and nail for every pound of steel they can get their hands on. Pressure of demand shows absolutely no sign of easing despite reports, here and there, of some slight slackening in general business. Such has not been reflected in the steel market. In fact, most consumers find it extremely difficult to obtain enough metal to satisfy current requirements. Some report supply conditions more stringent than at any time since the end of the war. However, in the main, large buyers' supplies appear ample for current operations, but since their inventories are small and unbalanced, the practice of "robbing Peter to pay Paul" to maintain schedules has become a normal routine.

ALLOCATIONS— Impact of voluntary allocation programs on overall steel supply will be felt with increasing force over coming weeks. Some of these programs only started Oct. 1. Consumers' fourth quarter quotas have been cut to allow for the allocations drain. However, all the supply difficulty is not due to allocations. Some of it stems from withdrawal of producers from servicing certain market areas distant from their plants.

EXPORTS— Substantial quantities of steel are flowing out of the country, thus contributing to the general stringency here. However, the outflow this year is substantially under that of 1947. In the first half of this year exports totalled 2,457,400 tons, down 26.5 per cent from the like period last year. About 1,193,000 tons of finished steel went overseas in first quarter, with some 222,000 tons additional going to Canada. An estimated 1,051,000 tons were exported during second quarter.

PRODUCTION— The tight situation in steel supply persists in the face of increased production this year compared with 1947. Output of ingots in first 8 months averaged 7,194,191 tons monthly, a rate in excess of 86 million tons annually. Actual output for the year may go even higher than now indicated with furnace operations promising to better the average monthly operating rate of 91 per cent achieved during the first 8 months. On the basis of 86 million tons of ingot production, finished steel output will total in excess of 65 million tons. Conversion ingot is contributing substantially to overall steel supply, and promises to increase.

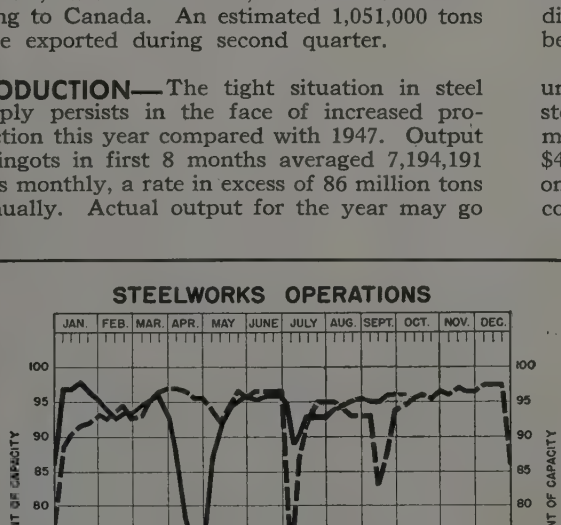
PIG IRON— Indications are blast furnace operators will be in better position this winter with respect to iron ore supplies than they were last year. Shipments of ore are expected to exceed 82 million tons during the 1948 lake shipping season, indicating a carryover of 18 million tons next April, 2 million tons more than on hand at lower lake docks and furnaces in April this year. Expectations are stocks will be sufficient to support blast furnace operations at the current high rate. Pig iron supplies, however, will continue short indefinitely into the future despite the addition of 5 new furnaces.

SCRAP— While prices on raw materials required by the steel industry are generally strong with advances in some lines, steel scrap is showing a somewhat easier tone at some consuming points. This is especially noteworthy coming as it does at a time when consumers are in the process of building up winter inventories. However, stocks are in better shape than a year ago.

PRICES— Finished steel prices are firm at levels established some time ago. However, present stability is believed temporary in view of the continued rise in prices on steelmaking raw materials and the possibility of an additional hike of 8 per cent in freight rates now being sought by the railroads.

STEEL's arithmetical price composites held unchanged last week as follows: Finished steel, $95.05; semifinished steel, $75.75; steelmaking pig iron, $44.69; steelmaking scrap $43.33. Preliminary weighted price composite on finished steel was 4.12679c for September, compared with 4.1203c for August.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended Oct. 2	Change	Same Week 1947	Same Week 1946
Pittsburgh	95	+ 0.5	104	97.5
Chicago	97	+ 0.5	94.5	91
Eastern Pa.	93	None	91.5	81
Youngstown	103	None	92	90
Wheeling	93.5	None	81.5	86
Cleveland	97.5	+ 0.5	90.5	91
Buffalo	104	None	88.5	90.5
Birmingham	100	None	99	99
New England	84	+ 1	80	92
Cincinnati	102	None	87	78
St. Louis	91.5	None	77.5	72.5
Detroit	101	— 4	92	76
Estimated national rate	96	None	94.5	90.5

Based on weekly steelmaking capacity of 1,802,476 net tons for 1948; 1,749,928 tons for 1947; 1,762,381 tons for 1946.

COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	Oct. 2	Sept. 25	Month Ago Sept. 1948	Year Ago Oct. 1947	5 Years Ago Oct. 1943
Finished Steel	$95.05‡	$95.05‡	$95.05‡	$75.41	$56.73
Semifinished Steel	75.75	75.75	75.75	56.80	36.00
Steelmaking Pig Iron	44.69	44.69	44.39	36.18	23.00
Steelmaking Scrap	43.33	43.33	43.33	39.85	19.17

FINISHED STEEL WEIGHTED COMPOSITE†

Sept. 1948	4.12679c
Aug. 1948	4.12032c
July 1948	4.06995c
Sept. 1947	3.45716c
Sept. 1943	2.44293c

***STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide mill prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (rerolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading producing points), and on Steelworks Scrap (No. 1 melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

†FINISHED STEEL WEIGHTED COMPOSITE: Computed in cents per pound, mill prices, weighted by actual monthly shipments of following products, representing about 82 per cent of steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. August and September, 1948, figures are preliminary.

‡Revised.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, wire rods, cents per lb; semifinished (except wire rods) and coke, dollars three months and one year ago. Finished material (except tin plate) and per net ton, others dollars per gross ton. Delivered prices represent lowest from mills.

Finished Materiarls

	Oct. 2, 1948	Sept., 1948	July, 1948	Oct., 1947
Steel bars, Pittsburgh mills	3.45c	3.45c	3.105c	2.90c
Steel bars, del. Philadelphia	3.79	3.79	3.545	3.301
Steel bars, Chicago mills	3.35	3.35	3.065	2.90
Shapes, Pittsburgh mills	3.275	3.275	2.975	2.80
Shapes, Chicago mills	3.25	3.25	2.965	2.80
Shapes, del. Philadelphia	3.48	3.48	3.18	2.947
Plates, Pittsburgh mills	3.50	3.50	3.155	2.95
Plates, Chicago mills	3.40	3.40	3.115	2.95
Plates, del. Philadelphia	3.71	3.71	3.41	3.162
Sheets, hot-rolled, Pittsburgh mills	3.275	3.275	2.975	2.80
Sheets, cold-rolled, Pittsburgh	4.00	4.00	3.70	3.55
Sheets, No. 10 galv., Pittsburgh	4.40	4.40	4.10	3.90
Sheets, hot-rolled, Gary mills	3.25	3.25	2.965	2.80
Sheets, cold-rolled, Gary mills	4.00	4.00	3.70	3.55
Sheets, No. 10 galv., Gary mills	4.40	4.40	4.10	3.90
Strip, hot-rolled, Pittsburgh mills	3.50	3.50	3.140	2.80
Strip, cold-rolled, Pittsburgh mills	4.375	4.375	3.965	3.55
Bright basic, wire, Pittsburgh	4.325	4.325	3.965	3.675
Wire nails, Pittsburgh mills	5.775	5.775	5.255	4.25
Tin plate, per base box, Pitts. dist.	$6.70	$6.80	$6.74	$5.75

Semifinished

Sheet bars, mill	$67.00*	$67.00*	$62.80	$53.57
Slabs, Chicago	52.00	52.00	47.80	40.18
Rerolling billets, Pittsburgh	59.00	59.00	47.80	40.18
Wire rod 3/8 to 1/4-inch, Pitts. dist.	3.775c	3.775c	3.415c	2.925c

* Nominal.

Pig Iron

	Oct. 2, 1948	Sept., 1948	July, 1948	Oct., 1947
Bessemer, del. Pittsburgh (N.&S. sides)	$48.08	$48.08	$44.08	$38.879
Basic, Valley	43.00	43.00	40.60	36.00
Basic, eastern del. Philadelphia	50.17	47.77	43.77	38.78
No. 2 fdry., del. Pgh. (N.&S. sides)	47.58	47.58	43.58	37.379
No. 2 fdry., del. Philadelphia	50.67	48.28	44.27	39.28
No. 2 foundry, Chicago	43.25	43.25	41.10	36.00
No. 2 foundry, Valley	43.50	43.50	41.10	36.50
Southern No. 2 Birmingham	43.38	43.38	40.72	34.88
Southern No. 2 del. Cincinnati	49.09	49.09	46.43	38.544
Malleable, Valley	43.50	43.50	40.30	36.50
Malleable, Chicago	43.50	43.50	41.50	36.50
Charcoal, low phos., fob Lyles, Tenn.	62.00	62.00	59.60	46.40
Ferromanganese, fob Aetna, Pa.	148.00	148.00	151.15*	151.00*

* F.o.b. cars Pittsburgh.

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$42.75	$42.75	$40.75	$39.90
Heavy melt. steel, No. 2, E. Pa.	41.50	41.50	40.00	39.50
Heavy melt. steel, No. 1 Chicago	41.75	41.75	40.05	39.55
Heavy melt. steel, No. 1 Valley	42.75	42.75	40.75	39.50
Heavy melt, steel, No. 1, Cleveland	42.25	42.25	40.25	38.25
Heavy melt. steel, No. 1 Buffalo	48.25	48.15	44.30	39.00
Rails for rerolling, Chicago	64.50	64.50	57.80	51.00
No. 1 cast, Chicago	70.50	71.10	68.50	46.40

Coke

Connellsville, beehive furnace	$14.50	$14.50	$14.25	$12.15
Connellsville, beehive foundry	17.00	17.00	17.00	14.50
Chicago, oven foundry, ovens	20.40	20.40	19.86	17.50

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, open market, $100-105 per gross ton. Forging quality $50 per net ton, mill.

Alloy Steel Ingots: $51 per net ton, mill.

Rerolling Billets, Blooms, Slabs: $52 per net ton, mill, except $62, Conshohocken, Pa.; $66, Monessen, Pa.; sales by smaller interests on negotiated basis at $85 per gross ton, or higher.

Forging Quality Billets, Blooms, Slabs: $61 per net ton, mill, except: $68, Conshohocken, Pa., mill.

Alloy Billets, Slabs, Blooms: Rerolling quality, $63 per net ton, mill, except: $70, Conshohocken, Pa.

Sheet Bars: $67 nom., per net ton, mill; sales in open market $110-$115 per gross ton.

Skelp: 3.25c per lb, mill.

Tube Rounds: $76 per net ton, mill; some sellers quoting up to $120 per gross ton.

Wire Rods: Basic and acid open-hearth, 7/32 & 3/8-inch, inclusive, 3.40c per lb, mill, except: 3.65c, Struthers, O.; 3.70c, Worcester, Mass.; 4.05c, Pittsburg, Calif.; 4.10c, Portsmouth, O., Los Angeles; 4.15c, Monessen, Pa. One producer quotes 3.90c, Chicago base. Basic open-hearth and bessemer, not resulphurized, 7/32 to 47/64-inch, inclusive, 3.50c, mill.

Bars

Hot-Rolled Carbon Bars (O.H. only) and Bar-Size Shapes under 3-in. (Base 20 tons one size): 3.35c, mill, except: 3.55c, Ecorse, Mich., Pittsburgh, Monessen, Aliquippa, Pa.; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, S. San Francisco, Los Angeles, Niles, Calif., Portland, Oreg., Atlanta, Seattle; 4.20c, Kansas City, Mo.; 4.25c, Minnequa, Colo.; 5.30c, Fontana, Calif.

Rail Steel Bars: (Base 10 tons): 3.35c, Moline, Ill.; 4.80c, Williamsport, Avis, Pa.

Hot-Rolled Alloy Bars: 3.75c, mill, except: 4.05c, Ecorse, Mich.; 4.80c, Los Angeles; 5.50c, Fontana, Calif.

Hot-Rolled Alloy Bar Shapes: 4.00c, mill.

Cold-Finished Carbon Bars (Base 20,000-39,999 lb): 4.00c, mill, except: 3.95c, Pittsburgh, Cumberland, Md.; 4.20c, Indianapolis; 4.25c, Monessen, Pa.; 4.30c, Ecorse, Mich.; 4.35c, St. Louis; 4.36c, Plymouth, Mich.; 4.40c, Newark, N. J., Hartford, Putnam, Conn., Mansfield, Readville, Mass.; 4.45c, Camden, N. J.; 5.30c, Los Angeles.

Cold-Finished Alloy Bars: 4.65c, mill, except: 4.75c, Monessen, Pa.; 4.85c, Indianapolis; 4.95c, Worcester, Mansfield, Mass., Hartford, Conn.

High-Strength, Low-Alloy Bars: 5.10c, mill, except: 5.40c, Ecorse, Mich.

Reinforcing Bars (New Billet): 3.35c, mill, except: 3.55c, Monessen, Pa.; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, Atlanta, Seattle, S. San Francisco, Los Angeles; 4.25c, Minnequa, Colo. Fabricated: To consumers: 4.10c, Pittsburgh; 4.25c, S. Duquesne, Pa., Gary, Ind., Youngstown; 5.00c, Seattle.

Reinforcing Bars (Rail Steel): 4.65c, Williamsport, Pa., mill; 5.25c, Huntington, W. Va.

Wrought Iron Bars: Single Refined: 8.60c, (hand puddled), McKees Rocks, Pa.; 9.50c, Economy, Pa. Double Refined: 11.25c (hand puddled), McKees Rocks, Pa., 11.00c, Economy, Pa. Staybolt: 12.75c, (hand puddled), McKees Rocks, Pa.; 11.30c, Economy, Pa.

Sheets

Hot-Rolled Sheets (18 gage and heavier): 3.25c, mill, except: 3.25-3.30c, Cleveland; 3.30c, Pittsburgh; 3.45c, Ecorse, Mich.; 3.95c, Pittsburg, Torrance, Calif.; 5.00c, Conshohocken, Pa.; 5.65c, Fontana, Calif.

Hot-Rolled Sheets (19 gage and lighter, annealed): 4.15c, mill, except: 4.40c, Alabama City, Ala.; 4.65c, Niles, O., 5.05c, Torrance, Calif., Kokomo, Ind.

Cold-Rolled Sheets: 4.00c, mill, except: 4.20c, Granite City, Ill., Ecorse, Mich., 4.95c, Pittsburg, Calif.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) 4.40c, mill, except: 5.00c, Niles, O.; 5.15c, Pittsburg, Torrance, Calif.; 5.30c, Kokomo, Ind.

Galvannealed Sheets: 4.95c, mill, except: 5.05c, Indiana Harbor, Ind.; 5.55c, Niles, O.; 5.70c, Kokomo, Ind.

Culvert Sheets, No. 16 flat Copper Steel (based on 5-cent zinc) 5.00c, mill, except: 5.40c, Granite City, Ill.; 5.45c, Kokomo, Ind.; 5.75c, Pittsburg, Torrance, Calif.
Copper-Iron: 5.75c, Granite City, Ill.; 5.35c, Irvin, Pa., Gary, Ind.

Aluminized Sheets: Hot-dipped, coils or cut to lengths: 7.75c, mill.

Long Ternes, No. 10 (Commercial quality): 4.80c, mill.

Long Ternes Ingot Iron: 5.20c, mill.

Enameling Sheets, No. 12: 4.40c, mill, except: 4.60c, Granite City, Ill.; 4.70c, Ecorse, Mich.; 6.00c, Niles, O.

Silicon Sheets, No. 24: Field: 5.15c, mill. Armature: 5.45c, mill, except: 6.05c, Niles, O. Electrical: Hot-rolled, 5.95c, mill, except: 6.05c, Kokomo, Ind.; 6.15c, Granite City, Ill.; 6.55c, Niles, O.
Motor: 6.70c, mill except: 6.90c, Granite City. Dynamo: 7.50c, mill, except: 7.40c, Follansbee, W. Va., Toronto, O.; 7.70c, Granite City, Ill. Transformer 72, 8.05c, mill, except: 7.90c, Follansbee, W. Va., Toronto, O. 65, 8.60c, mill. 58, 9.30c, mill. 52, 10.10c, mill.

High-Strength Low-Alloy Sheets: Hot-rolled, 4.95c, mill, except: 5.25c, Ecorse, Mich., and Conshohocken, Pa., mills.
Galvanized (No. 10), 6.75c, mill.
Cold-rolled, 6.05c, mill, except: 6.35c, Ecorse, Mich.

Strip

Hot-Rolled Strip: 3.25c mill; except: 3.30c, Cleveland, Pittsburgh, Riverdale, Ill.; 3.25-3.35c,* Sharon, Pa.; 3.45c, Ecorse, Mich., Atlanta; 3.60c, Detroit; 3.70c, West Leechburg, Pa.; 4.00c, Pittsburg, Torrance, Calif.; 4.25c, Seattle, S. San Francisco, Los Angeles; 4.20c, Kansas City, Mo.; 4.30c, Minnequa, Colo.; 5.90c, Fontana, Calif.

* Wider than 6-in. and 6-in. and narrower, respectively.

Cold-Rolled Strip (0.25 carbon and less): 4.00c, mill, except 4.00-4.25c, Warren, O.; 4.00-4.50c, Youngstown; 4.20c, Ecorse, Mich.; 4.25c, Riverdale, Ill.; 4.40-4.50c, Detroit; 4.50c, New Haven, Conn., West Leechburg, New Castle, Pa., Boston; 4.75c, Dover, O.; 4.50-5.00c, Trenton, N. J.; 4.75c, Kensington, Pa.; 4.80-5.05c, Wallingford, Conn.; 5.75c, Los Angeles; 7.10c, Fontana, Calif.

Cold-Rolled Alloy Strip: 9.50c, mill, except 9.80c, Worcester, Mass.

High-Strength, Low-Alloy Strip: Hot-rolled, 4.95c, mill, except: 5.25c, Ecorse, Mich., mill. Cold-rolled, 6.05c, mill, except: 6.35c, Ecorse, Mich., mill.

Tin, Terne Plate

Tin Plate: American Coke, per base box of 100 lb, 1.25 lb coating $6.60-$6.80; 1.50 lb coating $6.80-$7.00. Pittsburg, Calif., mill $7.35 and $7.55, respectively, for 1.25 and 1.50 lb coatings.

Electrolytic Tin Plate: Per base box of 100 lb. 0.25 lb tin, $5.80-$6.00; 0.50 lb tin, $6.00-$6.20; 0.75 lb tin, $6.20-$6.40.

Can Making Black Plate: Per base box of 100 lb. 55 to 70 lb basis weight, $5.20-$5.30; 75 to 95 lb basis weight, $5.10-$5.20; 100 to 128 lb basis weight, $5.20-$5.30. $5.75-$5.95, $5.65-$5.85, $5.75-$5.95, respectively, Pittsburg, Calif.

Holloware Enameling Black Plate: 29-gage, 4.75c per pound, except: 4.85c, Sparrows Point, Md.; 4.95c, Granite City, Ill.

Manufacturing Ternes (Special Coated): Per base box of 100 lb, $5.90-$6.00.

Roofing Ternes: Per package 112 sheets; 20 x 28 in., coating I.C. 8-lb, $15.50.

Plates

Carbon Steel Plates: 3.40c, mill, except: 3.40-3.60c, Cleveland; 3.45c, Sparrows Point, Md.; 3.60c, Pittsburgh; 3.65c, Ecorse, Mich.; 3.75c, Coatesville, Pa.; 3.95c, Claymont, Del., Conshohocken, Pa.; 4.30c, Seattle, Minnequa, Colo.; 4.56c, Houston, Tex.; 5.80c, Fontana, Calif.; 5.85c, Harrisburg, Pa.; 6.25c, Kansas City, Mo.

Floor Plates: 4.55c, mill.

Open-Hearth Alloy Plates: 4.40c, mill, except: 5.10c, Coatesville, Pa., mill.

High-Strength, Low-Alloy Plates: 5.20c mill, except: 5.10c, Coatesville, Pa.; 5.30c, Conshohocken, Pa., Sparrows Point, Md., Johnstown, Pa.; 5.65c, Ecorse, Mich., Sharon, Pa.

Shapes

Structural Shapes: 3.25c, mill, except: 3.30c, Bethlehem, Pa., Lackawanna, N. Y., Johnstown, Aliquippa, Pa.; 3.85c, Torrance, Calif.; 4.15c, Minnequa, Colo.; 4.30c, Seattle, S. San Francisco, Los Angeles; 5.75c, Fontana, Calif.

Alloy Structural Shapes: 4.05c, mill.

Steel Sheet Piling: 4.05c, mill.

High-Strength, Low-Alloy Shapes: 4.95c, mill, except: 5.05c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.

Wire and Wire Products

Wire to Manufacturers (carloads): Bright, Basic or Bessemer Wire, 4.15c, mill, except: 4.00c, Atlanta; 4.25c, Sparrows Point, Md., Kokomo, Ind.; 4.45c, Worcester, Mass.; 4.50c, Monessen, Pa., Minnequa, Colo., Buffalo; 4.70c, Portsmouth, O.; 4.80c, Palmer, Mass.; 5.10c, Pittsburg, Calif.; 5.15c, So. San Francisco; 5.40c, Shelton, Conn. One producer quotes 4.50c, Chicago base; another, 4.50c, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Basic MB Spring Wire, 5.55c, mill, except: 5.30c, Portsmouth, O.; 5.65c, Sparrows Point, Md., Monessen, Pa.; 5.85c, Worcester, Palmer, Mass., Trenton, N. J., 6.50c, Pittsburg, Calif.

Upholstery Spring Wire, 5.20c mill, except: 5.30c, Sparrows Point, Md., Williamsport, Pa.; 5.50c, Worcester, Mass., Trenton, N. J., New Haven, Conn.; 6.15c, Pittsburg, Calif.

Wire Products to Trade (carloads): Merchant Quality Wire: Annealed (6 to 8 Gage base), 4.80c, mill, except: 4.90c, Sparrows Point, Md., 4.95c, Monessen, Pa.; 5.10c, Worcester, Mass.; 5.15c, Minnequa, Colo., Kokomo, Ind.; 5.20c, Atlanta; 5.75c, So. San Francisco, Pittsburg, Calif. One producer quotes 5.15c, Chicago and Pittsburgh base; another, 5.20c. Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Galvanized (6 to 8 Gage base), 5.25c, mill, except: 5.35c, Sparrows Point, Md.; 5.40c, Monessen, Pa.; 5.55c, Worcester, Mass.; 5.60c, Kokomo, Ind., Minnequa, Colo.; 5.65c, Atlanta; 6.20c, Pittsburg, So. San Francisco, Calif. One producer quotes 5.60c, Pittsburgh and Chicago base; another, 5.65c, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Nails and Staples: Standard, cement-coated and galvanized nails and polished and galvanized staples, Column 103, mill, except: 105, Sparrows Point, Md., Kokomo, Ind.; 109 Worcester, Mass.; 110 Minnequa, Colo., Atlanta; 117, Portsmouth, O.; 123, Pittsburg, Calif.; 124, Cleveland; 126, Monessen, Pa.; $5.20 per 100 pound keg, Aliquippa, Pa.; $6.75, Conshohocken, Pa., Wheeling, W. Va. One producer quotes column 109, Chicago and Pittsburgh base; another, column 113, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Woven Fence (9 to 15½ Gage, inclusive): Column 109, mill, except: 113 Monessen, Pa., Kokomo, Ind.; 116, Minnequa, Colo.; 121 Atlanta; 132, Pittsburg, Calif. One producer quotes column 113, Pittsburgh and Chicago base; another, column 114, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Barbed Wire: Column 123 mill, except: 125, Sparrows Point, Md., Kokomo, Ind.; 126 Atlanta; 128 Monessen, Pa.; 130, Minnequa, Colo.; 143, Pittsburg, Calif.; 145, So. San Francisco. One producer quotes 127, Chicago and Pittsburgh base.

Fence Posts (with clamps): Column 114, Duluth; 115, Johnstown, Pa.; 116, Moline, Ill.; 122, Minnequa, Colo.; $123.50 per net ton, Williamsport, Pa.

Bale Ties (single loop): Column 106, mill, except: 108, Sparrows Point, Md., Kokomo, Ind.; 110, Atlanta; 113 Minnequa, Colo.; 130, So. San Francisco, Pittsburg, Calif. One producer quotes column 115, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Tubular Goods

Standard Steel Pipe: Mill prices in carlots, threaded and coupled, to consumers about $200 a net ton.

	Butt Weld				Butt Weld	
In.	Blk.	Gal.	In.		Blk.	Gal.
⅛	41½	12½	1¼		46½–	24–
¼	39½	14			49	32
⅜	36	9	1½		47–	24½–
½	40½–	16½ -			49½	32½
	43	24½	2		47½–	25–
¾	43½–	25½–			50	33
	46	28½	2½, 3		48–	25½–
1	46–	23½–			50½	33½
	48½	31½	3½ & 4		44½	25

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	39½	20	38½	19	27–	7½–
					38½	19
2½	42½–	23–	41½	22	32½–	13–
	43½	24			41½	22
3	42½–	23–	41½	22	35–	15½–
	43½	24			41½	22
3½ & 4	42½–	25–	43½	24	38½–	19–
	46½	27			43½	24
5 & 6.	42½–	23–	43½	24	38½–	19–
	44½	25			43½	24
7	....	..	....	..	43½	23

Line Steel Pipe: Mill prices in carlots to consumers about $200 a net ton.

	Butt Weld				Butt Weld	
In.	Blk.	Gal.	In.		Blk.	Gal.
⅛	40½	....	1¼		47–	28–
¼	38½	.....			48	29
⅜	35	....	1½		47½–	28½ -
½	41–	20½ -			48½	29½
	42	21½	2		48–	29–
¾	44–	24½–			49	30
	45	25½	2½ & 3		48½–	29½–
1	46½–	27½–			49½	30½
	47½	28½	3½ & 4		43½	

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	38½	19	37½	18	26–	6½–
					37½	18
2½	41½–	23	40½	..	31½–	12–
	42½				40½	21
3	41½–	23	40½	..	34–	14½–
	42½				40½	21
3½-4	41½–	22–	42½	..	37½–	18–
	45½	26			42½	23
5 & 6.	41½–	22	42½	..	40½–	20–
	43½	..			44½	24
8	45½	..	44½	24	41½–	21–
10	45	..	44	23	44	23½
12	44	..	44½	..	40½–	20
					43	22½

Standard Wrought Iron Pipe: Mill price in carlots, threaded and coupled, to consumers about $200 a net ton.

	Butt Weld		Lap Weld	
In.	Bulk.	Gal.	In.	Bulk.	Gal.
⅜	+59½	+93	1¼	+22	+50½
½	+20½	+50	1½	+15½	+43
¾	+10½	+39	2	+ 7½	+34
1 and 1¼	+ 4½	+30	2½-3½	+ 5	+29½
1½	— 1½	+26½	4	List	+23½
2	— 2	+26	4½-8	+ 2	+25
			9-12	+12	+34½

Boiler Tubes: Net base c.l. prices, dollars per 100', mill; minimum wall thickness, cut lengths 4 to 24"; inclusive.

		——Seamless——		——Elec. Weld——	
O.D.	B.W.	Hot	Cold	Hot	Cold
In.	Ga.	Rolled	Drawn	Rolled	Drawn
1	13	....	13.39	13.00	13.00
1¼	13	....	15.87	13.21	15.39
1½	13	$15.05	17.71	14.60	17.18
1¾	13	17.11	20.15	16.60	19.54
2	13	19.18	22.56	18.60	21.89
2¼	13	21.37	25.16	20.73	24.40
2½	12	23.54	27.70	22.83	26.88
2½	12	25.79	30.33	25.02	29.41
2¾	12	27.33	32.14	26.51	31.18
3	12	28.68	33.76	27.82	32.74
3¼	11	33.39	39.29	32.39	38.11
3½	11	35.85	42.20	34.78	40.94
4	10	44.51	52.35	43.17	50.78
4½	9	58.99	69.42	....	....
5	9	68.28	80.35	....	....
6	7	104.82	123.33	....	....

Rails, Supplies

Rails: Standard, over 60-lb: $3.20 per 100 lb, mill.

Light (billet): $3.55-$4.25 per 100 lb, mill.

Light (rail steel): $4.70 per 100 lb., Williamsport, Pa.

Railroad Supplies: Track bolts, treated: $8.50 per 100 lb., mill. Untreated: $8.25, mill.

Tie Plates: 4.05c mill, except: 4.20c, Pittsburg, Calif.; 4.50c, Seattle.

Splice Bars: 4.25c, mill.

Standard Spikes: 5.35c, mill, except: 5.25c, Pittsburgh.

Axles: 5.20c, mill.

Bolts, Nuts

Prices to consumers, f.o.b. midwestern plants. Sellers reserve right to meet competitors' prices, if lower. Additional discounts on carriage and machine bolts, 5 per carloads; 15 for full containers, except tire and plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	35 off
⅝ and ⅝ x 6-in. and shorter	37 off
¾-in. and larger x 6-in. and shorter	34 off
All diameters longer than 6-in.	30 off
Tire bolts	25 off
Plow bolts	47 off
Lag bolts, 6 in. and shorter	37 off
Lag bolts, longer than 6 in.	35 off

Stove Bolts

In packages, nuts separate, 58½-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hexagon	A.S.E. Light	A.S.E. Reg. and Heavy
⅞-in. and smaller	41 off	.....
½-in. and smaller	.....	38 off
½-in.-1-in.	39 off	.....
⅞-in.-1-in.	.....	37 off
1⅛-in.-1½-in.	37 off	35 off
1⅝-in. and larger	34 off	28 off

Additional discount of 15 for full containers.

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	46 off
Upset (1035 heat treated) ⅝ and smaller x 6 and shorter	40 off
¾, ⅞, & 1 x 6 and shorter	35 off

Square Head Set Screws

Upset 1-in. and smaller	51 off
Headless, ½-in. and larger	31 off

Rivets

F.o.b. midwestern plants,

Structural ½-in. and larger	6.75c
⅜-in. and under	48 off

Washers, Wrought

Fob shipping point, to jobbers.....50c-$2 off

Tool Steels

Tool Steel: Cents per pound, producing plants; reg. carbon 19.00c; extra carbon 22.00c; special carbon 26.50c; oil-hardening 29.00c; high carbon-chromium 52.00c; chrome hot work, 29.00c.

W	Cr	V	Mo	Co	Base Per lb
18	4	1	...	...	90.50c
18	4	2	...	...	102.5c
18	4	3	...	...	114.5c
18	4	2	...	9	168.5c
1.5	4	1	8.5	...	65.00c
6.4	4.5	1.9	5	...	69.50c
6	4	3	6	...	88.00c

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax

Pig Iron

Per Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., furnace	$48.00	$48.50	$49.00	$49.50
Newark, N. J., del.	50.39	50.89	51.39	51.89
Brooklyn, N. Y., del.	....	52.40	52.90	....
Philadelphia, del.	50.17	50.67	51.17	51.67
Birmingham, furnace	42.88	43.38	....	....
Cincinnati, del.	....	49.09	....	....
Buffalo, furnace	44.00	44.00	44.50	45.00
Boston, del.	52.42	52.42	52.92	....
Rochester, del.	46.22	46.22	46.72	47.22
Syracuse, del.	47.025	47.025	47.525	48.025
Chicago, furnace	42.50-43.00	43.00-43.50	43.50	44.00
Milwaukee, del.	44.22-44.72	44.72-45.22	45.22	45.72
Muskegon, Mich., del.	....	49.65-50.15	50.15	....
Cleveland, furnace	43.00	43.50	43.50	44.00
Akron, del.	45.17	45.67	45.67	46.17
Duluth, furnace	43.00	43.50	44.00	44.50
Erie, Pa., furnace	42.50	43.00	43.50	44.00
Everett, Mass., furnace	....	48.75	49.25	....
Geneva, Utah, furnace	43.00	43.50	....	....
Seattle, Tacoma, Wash., del.	....	50.63	....	....
Portland, Oreg., del.	....	50.63	....	....
Los Angeles, San Francisco.	50.13	50.63	....	....
Granite City, Ill., furnace	47.90	48.40	48.90	....
St. Louis, del.	48.65	49.15	49.65	....
Ironton, Utah, furnace	....	43.50	....	....
‡**Neville Island, Pa.,** furnace.	46.00	46.50	46.50	47.00
Pittsburgh, del., N.&S. Sides	47.08	47.58	47.58	48.08
Pittsburgh (Carnegie), furnaces	43.00	43.50	43.50	44.00
Sharpsville, Pa., furnace	43.00	43.50	43.50	44.00
Steelton, Pa., furnace	48.00	48.50	49.00	49.50
Struthers, O., furnace	42.50	....	....	....
Swedeland, Pa., furnace	50.00	50.50	51.00	....
Toledo, O., furnace	42.50	43.00	43.50	44.00
Cincinnati, del.	47.05	47.55	....	....
Youngstown, O., furnace	43.00	43.50	43.50	44.00
Mansfield, O.	46.87	47.37	47.37	47.87

‡ To Neville Island base add: $0.86 for McKees Rocks, Pa.; $1.31 Lawrenceville, Homestead, McKeesport, Monaco; $1.73 Verona; $1.94 Brackenridge; $1.08 to Ambridge and Aliquippa.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent Si (base).$56.50
6.51-7.00.. 57.75 9.01- 9.50. 64.00
7.01-7.50.. 59.00 9.51-10.00. 65.25
7.51-8.00.. 60.25 10.01-10.50. 66.50
8.01-8.50.. 61.50 10.51-11.00. 67.75
8.51-9.00.. 62.75 11.01-11.50. 69.00

Fob Jackson, O., per gross ton. Buffalo furnace $1.25 higher.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $81.75 furnace, Niagara Falls; $81 open-hearth and $82 foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.5% Mn over 1%; $1 a ton for 0.045% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn. .....$62 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Low Phosphorus

Steelton, Pa., $54; Buffalo, Troy, N. Y., $50. Philadelphia, $56.81 delivered.

Intermediate phosphorus, Central furnace, Cleveland, $48.00.

Differentials

Prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Fluorspar

Metallurgical grade, fob shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more $37; less than 60% $34.

Metallurgical Coke

Price per Net Ton

Beehive Ovens

Connellsville, furnace	$13.50-15.50
Connellsville, foundry	16.00-18.00
New River, foundry	16.50
Wise county, foundry	15.35
Wise county, furnace	14.60

Oven Foundry Coke

Kearney, N. J., ovens	$21.50
Chicago, ovens	20.40
Terre Haute, ovens	21.00
Milwaukee, ovens	21.15
New England, del.	22.75
Birmingham, del.	17.86
Indianapolis, ovens	20.85
Cincinnati, del.	21.40
Ironton, O., ovens	18.25
Erie, Pa., del.	22.45
Painesville, O., ovens	20.90
Cleveland, del.	22.45
Buffalo, del.	23.10
Detroit, del.	21.65
Philadelphia, ovens	20.55
Swedeland, Pa., ovens	20.50
Portsmouth, O., ovens	19.25

Coal Chemicals

Spot, cents per gallon, ovens

(Price effective as of Aug. 5)

Pure benzol	20.00
Toluol, one degree	20.50-26.50
Toluol, two degrees	23.00-26.50
Industrial xylol	20.50-26.50

Per pound, ovens

Phenol, 40 (car lots, returnable drums)	13.00
Do., less than carlots	13.75
Do., tank cars	12.00
Naphthalene flakes, balls, bbl to jobbers, "household use"	12.00

Per ton, bulk, ovens

Sulphate of ammonia	$45.00

Refractories

(Prices per 1000 brick, fob plant)

Fire Clay Brick

Super Duty: St. Louis Vandalia, or Farber, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., $100.

High-Heat Duty: Salina, Pa., $85; Woodbridge, N. J., St. Louis, Farber, or Vandalia, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., $80.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, Haldeman, or Athens, Ky., Troup, Tex., Stevens Pottery, Ga., or Portsmouth, O., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Pa., Bessemer, Ala., $66.

Ladle Brick

Dry Press: $55, Freeport, Merill Station, Clearfield, Pa.; Chester, New Cumberland, W. Va.; Irondale, Wellsville, O.; Goose Lake, Ill.

Wire Cut: $53, Chester, New Cumberland, W. Va.; Wellsville, O.

Malleable Bung Brick

St. Louis, Mo., Olive Hill, Ky., $83; Beach Creek, Pa., $73.

Silica Brick

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa. $85; Joliet or Rockdale, Ill., $89; Lehi, Utah, Los Angeles, $95.

Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., $80.

Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., $81.

Basic Brick

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Chrome brick or chemical-bonded chrome brick, $69, magnesite brick, $91; chemical-bonded magnesite, $80.

Magnesite

(Base prices per net ton, fob works, Chewelah, Wash.)

Domestic dead-burned, ⅜" grains: Bulk, $31; single paper bags, $35.50.

Dolomite

(Base prices per net ton)

Domestic, dead-burned bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Nario, Millersville, Martin, Gibonsburg, Woodville, O., $11.85; Thornton, McCook, Ill., $11.95; Dolly Siding, Bonne Terre, Mo., $12.05.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural) Lower Lake Ports

(Any increase or decrease in R. R. freight rates, dock handling charges and taxes thereon effective after Apr. 1, 1948, are for buyer's account.)

Old range bessemer	$6.60
Old range nonbessemer	6.45
Mesabi bessemer	6.35
Mesabi nonbessemer	6.20
High phosphorus	6.20

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56.62% contract	15.25

Foreign Ore

Cents per unit, cif Atlantic ports

Swedish basic, 60 to 68%	14.50
Brazil iron ore, 68-69%	18.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$26–$28

Manganese Ore

48-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 67.60c-72.60c.

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African

48% 2.8:1	$37.50
48% 3:1	39.00
48% no ratio	31.00

South African (Transvaal)

44% no ratio	$25.50-$26.00
45% no ratio	26.50
48% no ratio	29.00-30.00
50% no ratio	29.50-30.50

Brazilian—nominal

44% to 2.5:1 lump	$33.65

Rhodesian

45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00

Domestic (seller's nearest rail)

48% 3:1	$39.00

Molybdenum

Sulphide conc., lb., Mo., cont., Mines	$0.75

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras.

	SHEETS			STRIP		BARS				PLATES	
	H-R 10 Ga.	C-R 17 Ga.	Gal. **10 Ga.	†H-R	†C-R	H-R Rds. ⅝" to 3"	C-F Rds. ½" & up	H-R Alloy **4140	Standard Structural Shapes	Carbon ⅜"-¾"	Floor ⅜" & Thicker
Boston (city)	5.84	6.64	7.84	6.04	6.90	5.69	6.39	8.24-9.74	5.54	5.89	7.34
Boston (c'try)	5.69	6.49	7.69	5.89	6.75	5.54	6.24	8.09-9.59	5.39	5.74	7.19
New York (city)	5.73-5.80	6.73	7.74-7.83	6.08-6.28	...	5.83	6.58	8.22	5.52-5.78	5.98	7.48
New York (c'try)	5.53-5.60	6.53	7.54-7.63	5.88-6.08	...	5.63	6.38	...	5.32-5.58	5.78	7.28
Phila. (city)	5.50-5.86	6.61-6.81	7.42-7.62	5.46-5.81	...	5.57-5.65	6.31	7.94	5.24-5.40	5.52-5.65	6.73-7.16
Phila. (c'try)	5.35-5.71	6.46-6.66	7.27-7.47	5.31-5.66	...	5.42-5.50	6.16	7.79	5.09-5.25	5.37-5.50	6.58-7.01
Balt. (city)	5.43†	6.33	7.13	5.49	...	5.54	...	...	5.48	5.68	7.13
Balt. (c'try)	5.28†	6.18	6.98	5.34	...	5.39	...	...	5.33	5.53	6.98
Norfolk, Va.	5.75	...	...	...	...	6.00	7.00	...	6.00	6.00	7.50
Wash. (w'house)	5.81	...	...	5.87	...	5.92	...	...	5.86	6.06	7.51
Buffalo (del.)	5.20-5.25	5.95-6.00	7.75	5.70	6.50	5.35	6.05	9.50	5.25	5.60	7.70
Buff. (w'house)	5.05-5.10	5.80-5.85	7.60	5.55	6.35	5.20	5.90	9.40	5.10	5.45	7.55
Pitts. (w'house)	4.85-5.00§	5.75-5.85§	7.00-7.05	5.00-5.35	5.95-6.00	4.90-5.10	5.65	7.65	4.90-5.15	5.05-5.25	6.55
Det. (w'house)	5.40§	6.30	7.60	5.40	...	5.45	6.17	8.12	5.45	5.65	7.10
Cleveland (del.)	5.13-5.29	6.00-6.29	7.34-7.49	5.17-5.69	6.85	5.30-5.34	6.05-6.10	7.94-8.29	5.34-5.60	5.50-5.54	6.95-6.99
Cleve. (w'hse)	4.98-5.75	5.75-6.14	7.19-7.85	5.02-5.54	6.70	5.15-5.19	5.90-5.95	7.79-8.14	5.19-5.45	5.35-5.39	6.80-6.84
Cincin. (w'hse)	5.26	6.11	7.60	5.52	6.07	5.52	6.07	...	5.37	5.61	6.91
Chicago (city)	5.20	5.90†[8]	7.20	5.00	6.30	5.05	5.85	7.80[9]	5.05	5.25	6.70
Chicago (w'hse)	5.05	5.75†[8]	7.05	4.85	6.15	4.90	5.70	7.65[9]	4.90	5.10	6.55
Milwaukee (city)	5.37	6.07†[8]	7.37	5.17	6.47	5.22	6.02	7.97[9]	5.22	5.42	6.87
St. Louis (del.)	5.34§	6.24[8]	7.44	5.34	6.64	5.39	6.19[12]	6.64	5.39	5.59	7.04
St. L. (w'hse)	5.19§	6.09[8]	7.29	5.19	6.49	5.24	6.04[12]	9.49	5.24	5.44	6.89
Birm'ham (city)	5.20§	...	6.60	5.20	...	5.15	6.66	...	5.15	5.40	7.41-7.66
Birm'ham(c'try)	5.05§	...	6.45	5.05	...	5.00	6.51	...	5.00	5.25	7.26-7.51
Omaha, Nebr.	6.07	...	9.33	6.07	...	6.12	6.92	...	6.12	6.32	7.77
Los Ang. (city)	6.55§	8.05	8.20†	6.75	9.50	6.20	8.00-8.50	...	6.70	6.40	8.15
Los Angeles (w'house)	6.40§	7.90	8.05†	6.60	9.35	6.05	7.85-8.35	...	6.55	6.25	8.00
San Francisco	5.95[21]	7.15	8.05	6.75[21]	8.25[18]	5.90[21]	7.55	10.20‡‡	5.90	7.60	8.10
Seattle-Tacoma	6.35[17]	7.90[8]	8.40	6.70[17]	...	6.20[17]	8.15[1]	9.45[2]	6.30[17]	6.35[17]	8.40[17]

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 39,999 lb; [4]—three to 24 bundles; [5]—450 to 1499 lb; [6]—400 to 14,999 lb; [8]—400 to 1499 lb; [9]—1000 to 1999 lb; [12]—1000 to 39,999 lb; [12]—1000 lb and over; [16]—2000 lb and over; [17]—300 to 999 lb; [18]—1500 to 1999 lb; [19]—1500 to 39,999 lb; [20]—400 to 3999 lb; [21]—400 lb and over; [22]—500 to 1499 lb; [23]—Price (but not other price in range) applies to any and all quantities.

* Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; § 18 gage and heavier; ** as rolled; †† add 0.40 for sizes not rolled in Birmingham.

PRICES OF LEADING FERROALLOYS PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, $57, Palmerton, Pa.; $56, Pittsburgh and Chicago; (16% to 19% Mn.) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.). Carload, lump, bulk $160 per gross ton of alloy, c.l., packed, $172; gross ton lots, packed, $187; less gross ton lots, packed, $204; fob Alloy, W. Va., Niagara Falls, N. Y.; or Welland, Ont. Base price $162, f.o.b. Birmingham and Johnstown, Pa., furnaces; $160, Sheridan, Pa. Shipment from Pacific Coast warehouses on one seller add $31 to above prices, fob Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $201; less gross ton lots, $218 fob Chicago. Add or subtract $2 for each 1%, or fraction thereof, of contained manganese over 82% and under 78%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 26.0c, ton lot 27.1c, less ton 28.3c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Carload, 2" x D, packed 35.5c per lb of metal, ton lot 37c, less ton 39c. Delivered. Spot, add 2c.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.6c per lb of alloy, carload packed, 9.35c, ton lot 10.25c, less ton 11.25c. Freight allowed. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 20.5c per lb of contained Cr, c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8MxD, bulk 22.0c per lb, of contained Cr, c.l., packed 22.9c, ton lot 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.05% C 29.25c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, add C 1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lot 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Chromium Metal: (Min 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max. 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

SILICON ALLOYS

20-30% Ferrosilicon: Contract, carload, lump, bulk, 16.50-17.50c per lb of contained Si; packed 18.90c; ton lots 20.00c, fob Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 10.5c per lb of contained Si, carload packed 12.1c, ton lot 13.55c, less ton 15.2c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.0c per lb of contained Si, carload packed 14.3c, ton lot 15.45c, less ton 16.7c. Delivered. Spot, add 0.3c.

80-90% Ferrosilicon: Contract, carload, lump, bulk 14.65c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.) Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe.). C.l., lump, bulk, regular 19.0c per lb of Si c.l., packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe).

Contract, basis fob Niagara Falls, N. Y., lump per lb cl 6.90c; ton lots packed, 7.40c; 200 to 1999 lb, 8.15c, smaller lots 8.65c; or, lump, carload, bulk, 8.40c per lb of alloy, packed c.l. 9.20c, ton lots 9.30c, 200 to 1000 lb 9.65c, less 200 lb 10.15c per lb of alloy. Delivered. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

(*Please turn to Page* 154)

Stockpiling Plans To Be Revised

Suppliers of copper, lead, zinc, bismuth and cadmium may be asked at October conferences to make voluntary set-asides of these metals for government's stockpile

New York—Producers and importers of copper, lead, zinc, bismuth and cadmium may be asked to make voluntary set-asides of these metals for the government's stockpile of strategic materials, Charles Sawyer, secretary of commerce, announced last week in Washington.

Plans will be discussed with industry representatives in meetings to be held in October. The meetings, which will be held under provisions of the voluntary agreements program, are scheduled as follows: Copper, Oct. 12; lead and bismuth, Oct. 19; zinc and cadmium, Oct. 20.

The proposed plans will be formulated by the industry advisory committees and representatives of the Office of Industry Cooperation and the Munitions Board. Full consideration will be given to current supply conditions and present delivery schedules in order to minimize the possible impact on normal industrial relations.

Copper—Pressure for increased deliveries of copper is being maintained by domestic users and is being stepped up by foreign buyers. It is understood that India recently purchased 750 tons of Canadian copper at the equivalent of 23.50c, f.a.s. New York, for January-March shipment against payment in United States dollars. The domestic market held firm last week at 23.50c, Connecticut Valley, for electrolytic.

Lead—Primary production of lead in the United States dropped to 27,923 tons in August from 38,371 tons in July and was the smallest tonnage produced since June, 1946, according to the American Bureau of Metal Statistics. The decline was attributed to labor difficulties in the southwest. During the first half of this year, when the industry was free of labor disturbances, primary output averaged about 45,000 tons per month. Production from secondary sources amounted to 1635 tons, a decline of about 450 tons, bringing total production to 29,558 tons for August compared with 40,458 tons in July.

Shipments of lead to domestic consumers declined to 33,433 tons from 40,853 tons in July. Stocks of metal at refineries at the end of August totaled 18,971 tons, a drop of 3875 tons from stocks at the end of July.

A breakdown of shipments in August and July, respectively, reveals the following: Cable makers, 5979 tons and 8412 tons; battery manufacturers, 6015 tons and 6119 tons; ammunition makers, 2895 tons and 3595 tons; sundries, 2849 tons and 2920 tons.

Government stocks of refined lead (part of which are also reported in refineries' stocks) totaled 2707 tons as of Aug. 1 and Sept. 1, compared with 2089 tons during the first four months of the year. On Jan. 1, 1946, the government's stockpile stood at 68,700 tons.

Zinc—Due to scarcity of supplies, undertone of the zinc market remained strong last week. Reports have been heard here of resale lots of prime western and imported metal at premiums, but confirmation of sales at these higher prices is lacking. Activity in the export market continues light due to the stringency with prices unchanged at 15.50c for prime western and 16.50c for high grade, f.a.s. Gulf ports.

Owing largely to a labor strike in the Tri-state district the average daily rate of zinc production from domestic mines dropped 11 per cent in July to the lowest level since July, 1947, according to the Bureau of Mines. July zinc output, in terms of recoverable metal, was 47,092 short tons, an average of 1519 tons per day compared with 51,221 tons in June produced at an average rate of 1707 tons per day.

Zinc production in states east of the Mississippi river decreased 6 per cent in July owing to declines in outputs at mines in Tennessee and Virginia. In Arkansas, Kansas, Missouri, and Oklahoma the combined output dropped 2870 tons (41 per cent) principally as a result of a labor strike called at midnight on June 30 at the Eagle-Picher Mining & Smelting Co. operations in the Tri-state district.

The average daily rate of zinc production in the combined western states decreased from 959 tons in June to 920 tons in July. In Arizona and Washington the average daily rate of output increased slightly, but these gains were more than offset by declines in rates of output in the other states.

Tin—Tin production in Malaya continues to increase, production of concentrates in August having amounted to 5300 tons, or an increase of 141 tons over the July total. On the basis of 75 per cent tin content, the production in August was the equivalent to 3975 tons of fine tin compared with 2870 tons in July.

Prices in the domestic market continue firm at $1.03 New York, for Straits.

Silver—Handy & Harman's official silver quotation advanced Sept. 28 ½-cent to 75.75c per troy ounce. This was the first fluctuation in the market since Sept. 4, when it was advanced ¼-cent to 75.25c.

Metal Price Averages For September

(Cents per pound)

Electrolytic Copper, del. Conn.	23.500
Lead, St. Louis	19.325
Prime, Western Zinc, E. St. Louis	15.000
Straits Tin, New York	103.000
Primary Aluminum Ingots, del.	16.500
Antimony, f.o.b. Laredo, Tex.	35.000
Nickel, f.o.b. refinery	40.000
Silver, New York	75.284

Aluminum Production Gains

Washington—Production of primary aluminum in July totaled 52,937 short tons, a gain of 9 per cent over the 48,557 tons produced in June, according to the Bureau of Mines. The Troutdale plant of the Reynolds Metals Co., which had been closed during most of June, was nearing its normal level of operation by the end of July, but cutbacks in power supply forced a slackening of production at other plants, and it was evident that electrical energy was still the most important factor in the continued shortage of aluminum. Stocks of pig aluminum at the reduction plants declined 5000 tons, as shipments and use of pig exceeded production by that quantity. In this connection, it should be noted that, in order to insure correct measurement of primary aluminum production, this survey is conducted at the reduction-plant level. Movements of pig from the reduction plants to the ingot plants for further processing would not indicate accurately the overall aluminum supply situation, as this metal represents only a small portion of total industry stocks. However, the price rises of a cent or more in most items of aluminum scrap and secondary ingot that occurred in July attested the strength of demand for the metal.

Brass Ingot Output Declines

Washington—Production of brass ingot decreased 14 per cent to 24,877 short tons in May, according to the Bureau of Mines. Copper and brass scrap consumed in making ingot totaled 31,989 tons, 8 per cent less than in April, but secondary smelters' stocks of scrap increased 2639 tons.

The price of refined copper remained firm, but prices paid by ingot makers for copper and brass scrap declined fractionally during the month. The tendency for brass scrap prices to fluctuate since the war is in contrast to the continuing uptrend in the price for refined copper. This condition results from the fact that demand for copper wire, which is made from refined copper only, has been much stronger than that for copper-base castings, which are made chiefly from brass ingot produced from brass scrap by the secondary smelters. If refined copper, lead, tin and zinc, all of which are in tight supply, could be economically recovered from brass and bronze scrap the value of such scrap would be considerably enhanced.

Declines in consumption of 5 major scrap items in May ranged from 7 to 18 per cent but were partly offset by an increase of 24 per cent in use of low-grade scrap.

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Copper: Electrolytic, 23.50c, Conn. Valley; Lake, 23.62½c, Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 22.00c; 88-10-2 (No. 215) 31.00c; 80-10-10 (No. 305) 27.25c; No. 1 yellow (No. 405) 17.50c.

Zinc: Prime western 15.00c, brass special 15.25c, intermediate 15.50c, East St. Louis; high grade 16.00c, delivered.

Lead: Common 19.30-19.35c, chemical and corroding 19.40c, St. Louis.

Primary Aluminum: 99% plus, ingots 16.00-17.00c, pigs 15.00-16.00c. Base prices for 10,000 lb and over, fob shipping point, freight allowed.

Secondary Aluminum: Piston alloy (No. 122 type) 23.00-23.75c; No. 12 foundry alloy (No. 2 grade) 22.75-23.75c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.50-24.00c; grade 2, 22.50-23.50c; grade 3, 22.00-22.50c; grade 4, 21.00-22.00c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, fob Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) $1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, $1.028; grade C, 99.65-99.79%, incl., $1.024; 99.5-99.649% $1.024, grade F, 98-98.999% $1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 35.00; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 35.50c, fob Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; shot nom.; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $75-$77 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $1.90, del.; special or patented shapes, $2.

Cobalt: 97-98%, $1.65 per lb for 550 lb (keg); $1.67 per lb for 100 lb (case); $1.72 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 75.75c per ounce.

Platinum: $93-$96 per ounce.

Palladium: $24 per troy ounce.

Iridium: $110-$115 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, fob mill)

Sheet: Copper 37.18; yellow brass 33.75; commercial bronze, 95%, 37.11; 90%, 36.63; red brass, 85%, 35.64; 80%, 35.16; best quality, 34.63; nickel silver, 18%, 46.41; phosphor-bronze, grade A, 5%, 56.05.

Rods: Copper, hot rolled 33.03; cold drawn 34.28; yellow brass, free cutting, 33.44; commercial bronze, 95% 36.80; 90% 36.32; red brass, 85% 35.33; 80% 34.85.

Seamless Tubing: Copper 37.22; yellow brass 36.76; commercial bronze 90% 39.29; red brass 85% 38.55; 80% 38.07.

Wire: Yellow brass 34.04; commercial bronze, 95% 37.40; 90% 36.92; red brass, 85% 35.93, 80% 35.45; best quality brass 34.92.

Copper Wire: Bare, soft, fob eastern mills, c.l. 29.42½c, l.c.l. 29.92½-30.05c; weatherproof, fob eastern mills, c.l. 29.60-29.85c, l.c.l. 30.35c; magnet, delivered, c.l. 32.75-33.50c, 15,000 lb or more 33.00-33.75c, l.c.l. 33.50-34.25c.

ALUMINUM

Sheets and Circles: 2c and 3c mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	25.9	...	...
0.135-0.096	12-48	26.4	...	...
0.095-0.077	12-48	26.9	25.0	28.6
0.076-0.068	12-48	27.5	25.2	28.8
0.067-0.061	12-48	27.5	25.2	28.8
0.060-0.048	12-48	27.7	25.4	29.1
0.047-0.043	12-48	28.1	25.6	29.4
0.042-0.038	12-48	28.1	25.6	29.4
0.037-0.030	12-48	28.5	26.0	29.9
0.029-0.024	12-48	28.9	26.3	30.3
0.023-0.019	12-36	29.5	26.7	30.8
0.018-0.017	12-36	30.1	27.3	31.6
0.016-0.015	12-36	30.8	27.9	32.5
0.014	12-24	31.7	28.7	33.6
0.013-0.012	12-24	32.6	29.4	34.5
0.011	12-24	33.6	30.3	35.7
0.010-0.0095	12-24	34.6	31.3	37.0
0.009-0.0085	12-20	35.8	32.4	38.5
0.008-0.0075	12-20	37.1	33.6	40.1
0.007	12-18	38.5	34.9	41.9
0.006	12-18	40.0	36.2	46.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	Round R317-T	Round 17S-T	Hexagonal R317-T	Hexagonal 17S-T
0.125	45.0	47.0	...	...
0.156-0.203	38.5	40.0	...	...
0.219-0.313	35.5	37.0	...	...
0.344	34.0	36.00	...	...
0.375	33.0	35.5	42.5	43.0
0.406	33.0	35.5	...	...
0.438	33.0	35.5	42.5	43.0
0.469	33.0	35.5	...	...
0.500	33.0	35.5	42.5	43.0
0.531	33.0	35.5	...	...
0.563	33.0	35.5	40.5	40.5
0.594	33.0	34.5	...	...
0.625	33.0	35.5	40.5	40.5
0.656	33.0	35.5	...	...
0.688	33.0	35.5	40.5	40.5
0.750-1.000	32.0	34.5	37.0	38.0
1.063	32.0	34.5	35.5	36.5
1.125-1.500	31.0	33.5	35.5	36.5
1.563	31.0	33.5	...	35.5
1.625	30.0	32.5	34.5	35.5
1.688-2.000	30.0	32.5	...	...
2.125-2.500	29.5	31.5	...	...
2.625-3.375	28.5	30.5	...	...

LEAD

(Prices to jobbers, fob Cleveland, Pittsburgh)

Sheets: Full rolls, 140 sq ft or more, $23.25 per cwt.; add 50c per cwt., 10 sq ft to 140 sq ft; $1.25, less than 10 sq ft; $1, circles and segments. Pipe: Full coils, $22.50 per cwt; cut coils, $22.75. Traps and Bends: List price plus 70%.

ZINC

Sheets, 19.50-20.00c, fob mill, 36.00 lb and over. Ribbon zinc in coils, 18.25c-19.00c, fob mill, 36,000 lb and over. Plates, not over 12-in., 17.25c; over 12-in., 18.25c.

NICKEL

(Base prices, fob mill.)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, fob mill.)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb., 35.00-36.00c.

Plating Materials

Chromic Acid: 99.9%, flake, fob Philadelphia, carloads, 26.00c; 5 tons and over 26.50c; 1 to 5 tons, 27.00c; less than 1 ton, 27.50c.

Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 33.84c; oval 33.34c; electrodeposited, 31.09c; cast, 30.12c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 46.00c, fob Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 16.00c; 1000 to 19,900 lb, 15.00c, fob Niagara Falls, N. Y.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 26.25c; over 250 lb, 25.25c, fob Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 10 lb, 64.00c; fob Cleveland. Add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 26.50c; 275-lb, or 500-lb bbl, 24.50c, fob Cleveland.

Tin Anodes: Bar, 1000 lb and over 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 200 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb, 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c fob Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c. Prices fob Sewaren, N. J.

Zinc Cyanide: 100-lb drums 39.25c, fob Cleveland; 39.00c, Detroit; 38.00c, fob Philadelphia.

Stannous Sulphate: Less than 2000 lb, in 100 lb kegs, 100.00c, in 400 lb bbl. 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c.

Scrap Metals

BRASS MILL ALLOWANCES

(Based on 23.50c, Conn., for copper)

Prices in cents per pound for less than 15,000 lb fob shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.125	21.125	20.375
Yellow brass	18.000	17.750	17.125
Commercial Bronze			
95%	20.125	19.875	19.375
90%	19.750	19.500	19.000
Red brass			
85%	19.750	19.500	19.000
80%	19.500	19.250	18.750
Best Quality (71-79%)	19.000	18.750	18.250
Muntz Metal	17.250	17.000	16.500
Nickel, silver, 10%	19.625	19.375	9.813
Phos. bronze, A.	22.625	22.375	21.375
Naval brass	17.750	17.500	17.000
Manganese bronze	17.750	17.500	16.875

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 19.25, No. 2 copper 18.25, light copper 17.25, composition red brass 16.00, auto radiators 13.25, heavy yellow brass 11.50, brass pipe, 12.25.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 20.00, No. 2 copper 19.00, light copper 18.00, refinery brass (60% copper), per dry copper content 18.25.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire No. 1 17.50-18.00, No. 2 16.50-17.00, light copper 15.50-15.75, No. 1 composition red brass 13.75-14.00, No. 1 composition turnings 13.25-13.50, mixed brass turnings 8.00-8.25, new brass clippings 13.00-14.00, No. 1 brass rod turnings 10.50-11.00, light brass 7.50-8.00, heavy yellow brass 9.75-10.00, new brass rod ends 11.00-11.50, auto radiators, unsweated 11.50-12.00, cocks and faucets 11.25-11.75, brass pipe 11.00-11.50.

Lead: Heavy 17.50-18.00, battery plates 11.75, linotype and stereotype 18.00-18.50, electrotype 16.50-17.00, mixed babbitt 15.75-16.25, solder joints, 19.75-20.25.

Zinc: Old zinc 7.75-8.25, new die cast scrap 7.50-8.00, old die cast scrap 4.50-5.00.

Tin: No. 1 pewter 65.00-67.00, block tin pipe 83.00-84.00, No. 1 babbitt 51.00-54.00, siphon tops 50.00-52.00.

Aluminum: Clippings 2S 12.00-12.50, old sheets 9.00-9.50, crankcase 9.00-9.50, borings and turnings 5.50-6.00, pistons, free of struts, 9.00-9.50.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Sept. Avg.	23.500	19.325	15.000	103.000	16.500	35.000	40.000	75.284
Aug. Avg.	23.230	19.325	15.000	103.00	16.269	35.000	40.000	73.790
Sept. 1	23.50	19.30–19.350	15.000	103.00	16.00–17.000	35.000	40.000	74.750
Sept. 2	23.50	19.30–19.350	15.000	103.00	16.00–17.000	35.000	40.000	75.000
Sept. 3-27	23.50	19.30–19.350	15.000	103.00	16.00–17.000	35.000	40.000	75.250
Sept. 28-30	23.50	19.30–19.350	15.000	103.00	16.00–17.000	35.000	40.000	75.750

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, fob Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt. Steel	$42.50-43.00*
No. 2 Heavy Melt. Steel	42.50-43.00*
No. 1 Busheling	42.50-43.00*
Nos. 1, 2 & 3 Bundles	42.50-43.00
Machine Shop Turnings	37.50-38.00
Mixed Borings, Turnings	37.50-38.00
Short Shovel Turnings.	39.50-40.00
Cast Iron Borings	39.50-40.00
Bar Crops and Plate	49.00-49.50
Low Phos. Steel	49.00-49.50
Heavy Turnings	39.50-40.00

Cast Iron Grades

No. 1 Cupola	65.00-66.00
Machinery Cast	72.00-73.00
Charging Box Cast	59.00-60.00
Heavy Breakable Cast.	57.00-58.00
Malleable	69.00-70.00
Brake Shoe	55.50-56.00
Clean Auto Cast	58.00-59.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.50-44.00
R.R. Malleable	75.00-80.00
Axles	55.00-56.00
Rails, Rerolling	58.00-59.00
Rails, Random Lengths	54.00-56.00
Rails, 3 ft and under	61.00-62.00
Rails, 18 in and under	62.00-63.00
Railroad Specialties	61.50-62.00
Uncut Tires	54.50-55.00
Angles, Splice Bars	53.00-54.00

* Plus applicable freight springboard.

CLEVELAND

No. 1 Heavy Melt. Steel	$42.00-42.50*
No. 2 Heavy Melt. Steel	42.00-42.50*
No. 1 Busheling	42.00-42.50*
Nos. 1 & 2 Bundles	42.00-42.50*
Machine Shop Turnings	37.00-37.50
Mixed Borings, Turnings	36.50-38.50
Short Shovel Turnings.	38.00-38.50
Cast Iron Borings	38.00-38.50
Bar Crops and Plate	47.00-47.50
Punchings & Plate Scrap	47.00-47.50
Heavy Turnings	42.00-43.00
Alloy Free Turnings	40.00-41.00
Cut Structurals	48.50-51.50

Cast Iron Grades

No. 1 Cupola	69.00-71.00
Charging Box Cast	58.00-60.00
Stove Plate	58.00-60.00
Heavy Breakable Cast.	54.00-56.00
Unstripped Motor Blocks	58.00-60.00
Malleable	78.00-80.00
Brake Shoes	52.00-53.00
Clean Auto Cast	71.00-73.00
No. 1 Wheels	58.00-60.00
Burnt Cast	56.00-57.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00-44.00*
R.R. Malleable	80.00-82.00
Rails, Rerolling	60.00-66.00
Rails, Random Lengths	60.00-63.00
Rails, 3 ft and under	63.00-66.00
Cast Steel	57.00-59.00
Railroad Specialties	60.00-62.00
Uncut Tires	57.00-58.00
Angles, Splice Bars	61.00-63.00

* Plus applicable freight springboard on earmarked material.

VALLEY

No. 1 Heavy Melt. Steel	$42.50-43.00*
No. 2 Heavy Melt. Steel	42.50-43.00
No. 1 Bundles	42.50-43.00
Machine Shop Turnings	37.00-39.00
Short Shovel Turnings.	39.00-39.50
Cast Iron Borings	38.50-39.00
Low Phos.	48.50-50.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00-44.00*

* Plus applicable freight springboard.

MANSFIELD

Machine Shop Turnings	$37.50-38.00
Short Shovel Turnings.	39.50-40.00

CINCINNATI

No. 1 Heavy Melt. Steel	$42.00
No. 2 Heavy Melt. Steel	42.00
No. 1 Busheling	42.00
Nos. 1 & 2 Bundles	42.00
Machine Shop Turnings	36.00
Mixed Borings, Turnings	36.00
Short Shovel Turnings.	38.00
Cast Iron Borings	37.00

Cast Iron Grades

No. 1 Cupola Cast	63.00
Charging Box Cast	53.00
Heavy Breakable Cast.	59.00
Stove Plate	55.00
Unstripped Motor Blocks	56.00
Brake Shoes	50.00
Clean Auto Cast	63.00
Drop Broken Cast	71.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00
R.R. Malleable	75.00
Rails, Rerolling	62.00
Rails, Random Lengths	58.00
Rails, 18 in. and under	63.00

DETROIT

(Brokers' buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$37.50-38.00
No. 1 Busheling	37.50-38.00
Nos. 1 & 2 Bundles	37.50-38.00
No. 3 Bundles	37.50-38.00
Machine Shop Turnings	31.50-32.00
Mixed Borings, Turnings	31.50-32.00
Short Shovel Turnings.	32.50-33.00
Cast Iron Borings	32.50-33.00
Punchings & Plate Scrap	42.50-43.00

Cast Iron Grades

No. 1 Cupola Cast	60.00-65.00
Heavy Breakable Cast.	54.00-59.00
Clean Auto Cast	60.00-65.00

BUFFALO

No. 1 Heavy Melt. Steel	$48.00-48.50
No. 2 Heavy Melt. Steel	41.75-42.25
No. 1 Busheling	41.75-42.25
No. 1 & 2 Bundles	41.75-42.25
Machine Shop Turnings	36.75-37.25
Mixed Borings, Turnings	36.75-37.25
Cast Iron Borings	37.75-38.25
Short Shovel Turnings.	38.75-39.25
Low Phos.	49.00-50.00

Cast Iron Grades

Mixed Cupola	65.50-66.50
No. 1 Cupola	68.00-69.00
Heavy Breakable Cast.	55.00-57.00
Malleable	70.00-75.00
Clean Auto Cast	62.00-64.00

Railroad Scrap

Rails, 3 ft. and under.	61.00-62.00
Railroad Specialties	60.00-61.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$45.00-45.50
No. 2 Heavy Melt. Steel	41.50
No. 1 Busheling	41.50
Nos. 1 & 2 Bundles	41.50
No. 3 Bundles	39.50
Machine Shop Turnings	37.50
Mixed Borings, Turnings	37.50
Short Shovel Turnings.	38.50
Bar Crop and Plate	50.00-51.00
Punchings & Plate Scrap	50.00-51.00
Cut Structurals	50.00-51.00
Elec. Furnace Bundles.	47.00-48.00
Heavy Turnings	45.50-46.50
No. 1 Chemical Borings	46.00-46.50

Cast Iron Grades

No. 1 Cupola Cast	63.00-65.00
No. 1 Machinery Cast.	67.00-68.00
Charging Box Cast	64.00-65.00
Heavy Breakable Cast.	62.00-63.00
Unstripped Motor Blocks	59.50
Malleable	76.00-78.00
Clean Auto Cast	64.00-65.00
No. 1 Wheels	68.00-70.00

NEW YORK

(Brokers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$39.00
No. 2 Heavy Melt. Steel	37.00
No. 1 Busheling	37.00
Nos. 1 & 2 Bundles	37.00
No. 3 Bundles	35.00
Machine Shop Turnings	29.00-29.50
Mixed Borings, Turnings	29.00-29.50
Short Shovel Turnings.	30.00-31.50
Punchings & Plate Scrap	42.00-42.50
Cut Structurals	42.00-42.50
Elec. Furnace Bundles.	42.00-42.50

Cast Iron Grades

No. 1 Cupola Cast	57.00-58.00
Charging Box Cast	57.00-58.00
Heavy Breakable	56.00-57.00
Unstripped Motor Blocks	53.50-54.50
Malleable	68.00-69.00

BOSTON

(Fob shipping point)

No. 1 Heavy Melt. Steel	$38.90
No. 2 Heavy Melt. Steel	34.40
No. 1 Bundles	34.40
No. 1 Busheling	34.40
Machine Shop Turnings	29.90
Mixed Borings, Turnings	29.90
Short Shovel Turnings.	31.90
Bar Crops and Plate	40.00-41.00
Punchings & Plate Scrap	40.00-41.00
Chemical Borings	37.00-38.00

Cast Iron Grades

No. 1 Cupola Cast	60.00-65.00
Heavy Breakable Cast.	60.00-62.00
Stove Plate	54.00-55.00
Unstripped Motor Blocks	50.00-52.00
Clean Auto Cast	54.00-56.00

CHICAGO

No. 1 Heavy Melt. Steel	$41.50-42.00
No. 2 Heavy Melt. Steel	41.50-42.00
No. 1 Bundles	41.50-42.00
No. 2 Bundles	41.50-42.00
No. 3 Bundles	39.50-40.00
Machine Shop Turnings	36.50-37.00
Mixed Borings, Turnings	36.50-37.00
Short Shovel Turnings.	38.50-39.00
Cast Iron Borings	37.50-38.00
Bar Crops and Plate	47.00-48.00
Punchings	48.00-49.00
Elec. Furnace Bundles.	42.50-43.00
Heavy Turnings	41.00-41.50
Cut Structurals	46.50-47.00

Cast Iron Grades

No. 1 Cupola Cast	70.00-71.00
Clean Auto Cast	70.00-71.00
No. 1 Wheels	61.00-63.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	45.00-46.00
Malleable	81.00-82.00
Rails, Rerolling	64.00-65.00
Rails, Random Lengths	58.00-59.00
Rails, 3 ft and under	62.00-63.00
Rails, 18 in. and under	63.00-64.00
Railroad Specialties	55.50-56.50
Angles, Splice Bars	57.00-58.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$44.00-45.00
No. 2 Heavy Melt. Steel	40.00-41.00
Machine Shop Turnings	35.00-36.00
Short Shovel Turnings.	36.50-37.50

Cast Iron Grades (Fob shipping point)

No. 1 Cupola Cast	65.00-66.00
Mixed Cast	56.00-58.00
Heavy Breakable Cast.	59.00-60.00
Brake Shoes	60.00-61.00
Clean Auto Cast	65.00-67.00
Burnt Cast	59.00-60.00

Railroad Scrap

R. R. Malleable	71.00-72.00
Rails, Rerolling	63.00-65.00
Rails, Random Lengths	56.00-59.00
Rails, 3 ft and under	60.00-61.00
Uncut Tires	51.00-52.00
Angles, Splice Bars	54.00-56.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$39.50
No. 2 Heavy Melt. Steel	39.50
No. 1 Busheling	39.50
Nos. 1 & 2 Bundles	39.00
No. 3 Bundles	37.00
Long Turnings	24.50
Short Shovel Turnings.	26.00-27.00
Cast Iron Borings	25.00
Bar Crops and Plate	40.00
Cut Structurals	38.50

Cast Iron Grades

No. 1 Cupola Cast	63.00
Stove Plate	60.00-62.00
No. 1 Wheels	59.00-61.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	38.00
R.R. Malleable	nom.
Axles, Steel	50.00
Rails, Rerolling	53.00-55.00
Rails, Random Lengths	45.00-48.00
Rails, 3 ft and under	53.00-55.00
Angles and Splice Bars	52.00-53.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*27.50
No. 2 Heavy Melt Steel	*27.50
No. 1 Busheling	*27.50
Nos. 1 & 2 Bundles	*27.50
No. 3 Bundles	*24.50
Machine Shop Turnings	*18.00
Bar Crops and Plate	*27.50
Cast Steel	*27.50
Alloy Free Turnings	*18.00
Cut Structurals	*27.50

Railroad Scrap

No. 1 Heavy Melting	*28.50
Axles	*34.00
Rails, Random Lengths	*29.00

* Fob California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	$27.50
No. 2 Heavy Melt. Steel	27.50
No. 1 Busheling	27.50
Nos. 1 & 2 Bundles	27.50
No. 3 Bundles	24.50
Machine Shop Turnings	21.00-22.50
Mixed Borings, Turnings	21.00-22.50
Punchings & Plate Scrap	35.00
Cut Structurals	26.00-28.00

Cast Iron Grades

No. 1 Cupola Cast	40.00-42.00
Heavy Breakable Cast.	35.00
Stove Plate	30.00
Unstripped Motor Blocks	32.50
Malleable	40.00
Brake Shoes	35.00
Clean Auto Cast	40.00
No. 1 Wheels	37.50-40.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	28.50
Railroad Malleable	30.00
Rails, Random Lengths	30.00-32.00
Angles and Splice Bars	28.50

LOS ANGELES

No. 1 Heavy Melt. Steel	$27.50
No. 2 Heavy Melt. Steel	27.50
Nos. 1 & 2 Bundles	27.50
Machine Shop Turnings	16.00
Mixed Borings, Turnings	15.50-16.00
Punchings & Plate Scrap	28.00
Elec. Furnace Bundles.	28.00

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00

HAMILTON, ONT.

(Ceiling prices, delivered)

Heavy Melt.	$22.00
No. 1 Bundles	22.00
Mechanical Bundles	20.00
Mixed Steel Scrap	19.00
Mixed Borings, Turnings	17.00
Rails, Remelting	28.00
Rails, Rerolling	26.00
Bushelings	17.00
Bushelings, new factory, prep'd	21.00
Bushelings, new factory, unprep'd	16.00
Short Steel Turnings	17.00

Cast Iron Grades*

No. 1 Cast	42.00-48.00
No. 2 Cast	35.00-37.00

* Removed from price control Aug. 9, 1947; quoted on basis of fob shipping point.

Sheets, Strip . . .

Sheet Prices, Page 130

Output not up extent indicated by expansions because of equipment obsolescence, etc.

Pittsburgh — Sheet and strip output has not been increased to extent indicated by installation of additional rolling facilities to date this year. Need to overhaul old facilities and general ingot shortage are major factors preventing producing interests from fully utilizing existing equipment. Most equipment being reconditioned will be speeded up to meet present day operating conditions. Another factor restricting full utilization of new rolling facilities is unavoidable delay in increasing auxiliary equipment capacity such as pickling, annealing, shearing, etc. Some sellers have established a 10 per cent across-the-board product reduction in monthly mill allotments through remainder of this year. One interest also has tentatively established a similar reduction in January allotments. Increased steel requirements under the voluntary allocation program have forced steel producers to alter their product mix. Sellers are anticipating further increase in steel requirements under voluntary allocation programs, involving larger tonnages of galvanized and enameling sheets.

Boston — An advance in hot strip covering sizes and gages slit from coils is announced by one producer while spreads in mill prices for cold-rolled strip adds to confusion. This also holds for stainless. Users of flat-rolled will be further pinched for supply this quarter with allocations reduced up to 20 per cent; hot-rolled carbon sheets are notably short and some producers have no fixed allocations. Lower hot strip allocations are also threatening cold mill schedules and there will be further revisions. Galvanized, already tight, is narrowed by voluntary program needs. More tonnage is earmarked for programs and, if continued, fourth quarter allocations will be revised in some cases. First-quarter allocation of electrical sheets will begin shortly.

New York — Stringency in sheets is increasingly pronounced. There should be a heavier flow, as production over the closing month of the year is likely to be higher than in the quarter just ended, but an increasing portion of the output will be against old orders and against certified programs, which adds to the difficulty of the average consumer in obtaining new tonnage. Only in specialties does there appear to be any suggestion of balance between supply and demand. Even the situation in stainless sheets is becoming increasingly tighter, although some producers still have tonnage available for shipment in the final month of the year.

Philadelphia — District sheet steel consumers, other than those certified for special preference, will receive less tonnage over the remainder of the year than they did in the second quarter, despite some anticipated improvement in mill production. Not only will the increase in voluntary allocation programs have some bearing on this situation, but also steady withdrawal of various inland producers from eastern seaboard on major grades under the added impetus of the new pricing system. While one leading plate producer has not yet set up consumer quotas for the last two months of the year, most sellers have done so with supply far short of consumers' requirements. Supply appears more stringent than at any time since the war.

Chicago—Judging from complaints of sheet and strip consumers over fourth-quarter cuts in mill quotas the impression is gained that tonnage received is less than a year ago. For the most part, however, consumers have received more steel this year than last, because it has been a better production year. However, demand for flat-rolled products has grown at a faster pace than production, making for a tightness greater than during late 1947.

Birmingham—Sheet supply situation remains exceedingly tight. Sheet users are not clear as to allocations for the fourth quarter, but some trimming likely will be made due to large carryovers. Strip production is pretty well rounded, especially in cotton ties.

St. Louis — Granite City Steel Co. has opened its fourth-quarter sheet steel books for December only. Carryover filled the other two months. Orders are restricted, however, to cold-rolled products and silicon and culvert sheets. Requests are coming in under the voluntary allocations programs and the company has accepted a plate order for the barge program. Granite City formerly had planned to wind up its plate production with completion of a pipeline job. Considerable steel tonnage has been allocated to freight cars for some time. Spokesmen assert the shift to barge plates won't hurt sheet output seriously. American Zinc's eight-week strike has shut down Granite City's zinc coating operations temporarily. September's sheet production likely will equal August's, which was 10 per cent above that of July. Company still expects to be current on orders by Jan. 1. Pig iron and adjustment difficulties in its new cold reduction auxiliary equipment are the uncertain factors.

Price Listing Corrected

Youngstown—Cold Metal Products Co., this city, is quoting cold-rolled carbon steel strip 4.50c per pound, mill. This company's price on cold rolled strip was listed erroneously at 4.80c in the special report on pricing, page 51 of the Sept. 27 issue of STEEL.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 130

Seattle — The steel mill situation is unchanged here. Reinforcing bar mills are running at capacity with heavy backlogs. Immediate effort is to speed deliveries and roll pending commitments. Estimators are busy figuring a number of major construction projects to be placed in the near future. It is still a buyers' market with many small jobs being offered, but mills are careful in accepting new business with pending contracts and a changing price market counseling caution.

Steel Bars . . .

Bar Prices, Page 130

New York — Bar schedules are fairly well established for the remainder of the year, leading producers declare. Consumer quotas have been set up and short of a war emergency, producers see little likelihood of any further changes with regard to certified tonnage before next year. Consumer quotas are smaller than for the quarter just ended, although the cut in general has not been as pronounced as in the major flat rolled items. At the same time, however, general buyers should actually receive about as much tonnage, including arrearages, as they received during the third quarter, as production is expected to be somewhat higher.

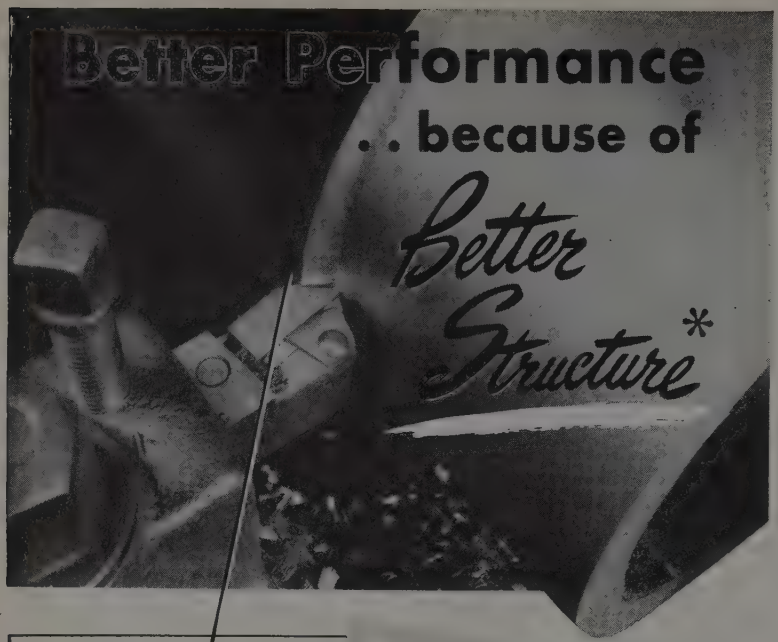
Certain exceptions will be consumers of hot carbon bars who have depended upon producers, which have cut their consumer quotas in order to supply their own cold finishing departments with more tonnage.

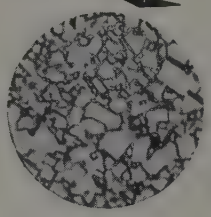
Boston — Heavy demand for alloys is extending deliveries, notably on heat-treated stock. Furnace equipment is taxed and some tonnage is shipped without heat-treatment to be processed by consumers. Some mills have opened books for first quarter on cold-finished alloys, but are cautious in accepting orders on various wire sizes, although freer within the ⅞ to 3-inch range. For cold drawing, hot-rolled alloy bars are in shorter supply with numerous mills than are carbon grades. Except with one producer, bar allocations this quarter are no larger or smaller; in this case allocations were cut 20 per cent, but with 33 per cent formerly blanked out for carryover eliminated, there is a net gain of 13 per cent in tonnage available in carbon bars.

Pittsburgh — At least one producer reports receipt of relatively large alloy steel bar orders for November delivery under the military allocation program. Some of this tonnage is of shell steel specifications. Reduction in monthly mill allotments for fourth quarter represents about 10 per cent for both carbon and alloy bars to those consumers not involved in preferred programs. Upward trend in demand for hot-rolled and cold-finished alloy bars shows no signs of leveling off. Unbalanced inventories among cold finishers continue to adversely affect production schedules, and this situation is expected to be further aggravated by indicated reduction in mill allotments over remaining months this year.

Chicago—Bar users, particularly forgers, are suffering under the impact of the 11 voluntary allocations programs. Instances are reported where mill quotas for fourth quarter have been cut 20 per cent or more. Allocations programs do not account for this depth of cut, but barmakers already were running behind in shipments. Under the decreases imposed, it is hoped that by yearend quotas and bar production will be in reasonable balance. Alloy grades are fully as tight as carbon grades of bars.

St. Louis—Merchant bar production remains four to five months behind orders, due largely to inability to get enough steel. Fourth-quarter and most of first-quarter schedules are filled, principally with carryover.





This Kennametal Style 11H90 Tool turns five of these semi-steel cast-iron cylinder liners compared to one with the carbide tool formerly used.

* Consistent soundness and uniformity of structure characterize all Kennametal compositions, as illustrated in the micrograph above (1500 times enlargement). Note absence of large grains, and virtual freedom from porosity.

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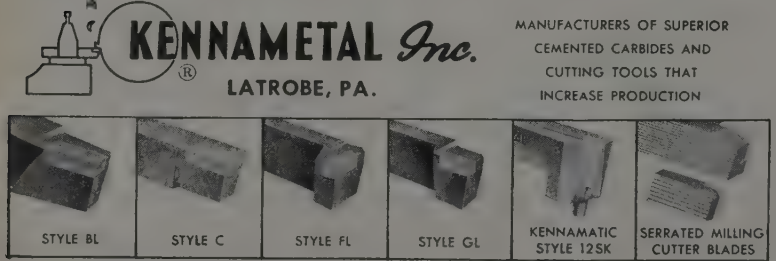


Demand shows no signs of easing. Reinforcing bars are easier, being available in quantity for construction starts in five to six weeks. Local bar producers predict increased defense requirements soon will set deliveries back farther. Pig iron scarcity is tightening operations, but is not yet a serious curtailment threat.

Tin Plate . . .

Tin Plate Prices, Page 131

Pittsburgh — Sellers note normal seasonal trend in increased specifications for electrolytic tin plate. Lighter coating requirements for general line cans are expected to represent a larger proportion of tin mill product requirements throughout fourth quarter, reflecting seasonal decline in hot-dipped tin plate needs for perishable food packs. Overall tin mill product output this year should exceed peacetime record established last year if current production schedules are maintained. However, the gain likely will be relatively slight for general ingot shortage prevented full utilization of new production facilities. Another factor is continued limitations on pig tin consumption, a condition which may prevent substantial increase in tin plate output, at least through early months of next year. Mill inventories of tin mill products remain negligible, while unprecedented container demand also has prevented can companies from augmenting depleted stocks. Higher tin plate contract prices for 1949 would appear logical, for present prices were established when pig tin was selling at 80.00c per pound. Price of this item since advanced to $1.03, while higher freight rates and wages also have combined to substantially increase production costs.

Tubular Goods . . .

Tubular Goods Prices, Page 131

Boston — At least two more pipe producers have eliminated consigned stocks and adopted an outright selling policy to distributors. There is considerable reshuffling of distributor accounts with some jobbers forced to look for new supply sources. One eastern mill has withdrawn from the Boston area and northern points where freight and a $4 higher mill price result in a delivered price disadvantage; Worcester, Hartford and Springfield are retained, but line of distribution roughly follows points where prices are about equalized with Pittsburgh. Other mills are allocated for fourth quarter and reluctant to take on new accounts at expense of regular distributors. For first quarter, one large supplier has blanked out two months and otherwise cut quotas which adds up to a reduction of 70 per cent on boiler tubes. Pipe continues in short supply and welded stainless tubing is tightening.

Seattle—Cast iron pipe demand is slow because of inability of mills to meet the potential demand in this area. Considerable tonnage is held aboard strike-bound ships and buyers are increasingly critical.

Structural Shapes . . .

Structural Shape Prices, Page 131

New York — Structural activity is enlivened by the placing here of two power plant projects, each involving 3000 tons, one for erection in West Virginia. Somewhat in contrast with recent buying, most contracts reported here over the past week involve private work, instead of public construction. However, a substantial amount of public work is pending for early action.

Structural awards in August amounted to 163,963 tons, as compared with a revised total of 174,319 tons in July, according to the American Institute of Steel Construction Inc. However, while August bookings were down from the preceding month they were 12 per cent greater than in the corresponding month last year. Accumulated bookings for the first eight months amounted to 1,300,371 tons, being up 23 per cent over the corresponding period of 1947.

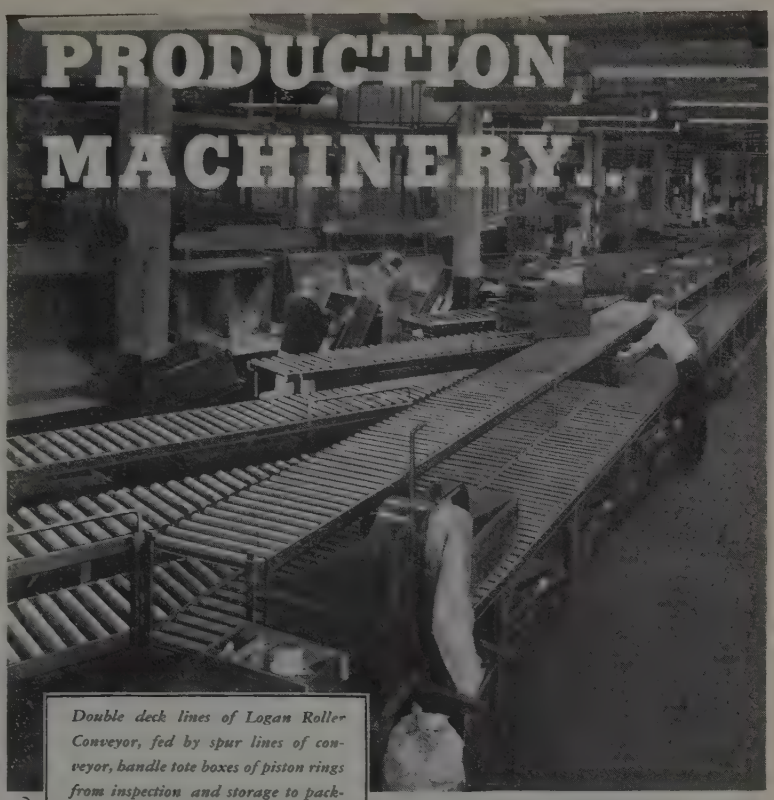
August shipments total 163,369 tons, compared with 156,089 tons for July, the latter a revised figure. Total shipments for the first eight months were 1,285,117 tons, or 6.5 per cent heavier than for the first eight months of last year. Backlog tonnage available for fabrication within the next four months, as of the beginning of September, was 690,724, as compared with 638,953 a year ago.

Pittsburgh — Structural fabricators are still uncertain in regard to the extent of the indicated reduction in monthly mill allotments throughout the fourth quarter. Some mills are establishing future scheduling on a month-to-month basis, thus accentuating the problem of fabricators in making commitments on new work very far ahead. Bids on public projects continue to exceed original cost estimates. Some bridge and highway work has been delayed because of this, while industrial plant expansion programs continue to be held in abeyance due to high construction costs and also because of difficulties in estimating costs as a result of f.o.b. mill pricing. Supply of plates remains among the tightest of all steel products.

Boston — Structural fabricating shops have assigned fourth quarter mill quotas and in some cases are over-committed; most are more reluctant to quote on slackening volume of new work and per pound cost of fabricated structural steel in place is at an all-time high. This is resulting in some postponement of projects. Warehouses are hit hard by lower fourth quarter allocations of plain material and distributors are in no position to supply fill-in tonnage to shops and other consumers.

Philadelphia — Structural buying was featured last week by the placing of 1500 tons for a plant addition for the Alan Wood Steel Co., Conshohocken, Pa. Other awards were light and scattered. Although fabricators have substantial order backlogs and shape supply is tight.

Seattle — Difficulty in obtaining material, due to reduced allocations and the stoppage of water transportation, is limiting operations of fabricators who hesitate to bid on large



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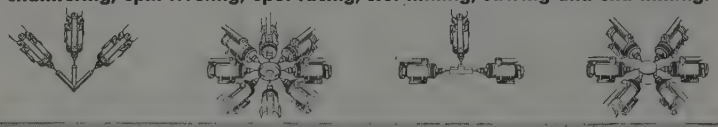

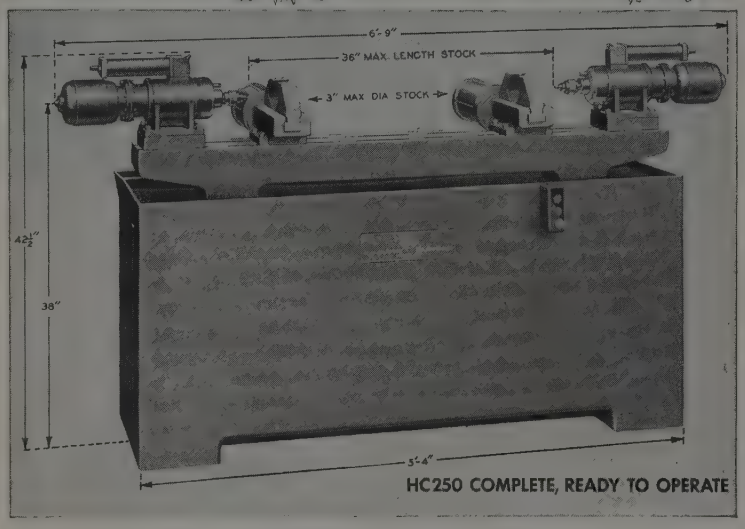

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projects as the supply situation is extremely critical. Considerable small business, within the range of inventories, is being taken.

Juneau, Alaska—In connection with government's proposed $70 million military construction program in Alaska during the coming year, the district engineer reports that at two supply centers in Alaska he has available about 30,000 tons of spare parts and 200,000 tons of general construction materials. Much of the above was obtained from army installations in Alaska, Hawaii and the Philippines. For the most part they are suitable for use in the Alaskan program, the engineer informs prospective bidders. At the various job sites are 6487 pieces of construction equipment, 90 per cent made by plants of national prominence. For the information of contractors, it is stated that lumber, coal and concrete products will be available in Alaska; a foundry has been established at Anchorage and acetylene and oxygen are being produced at Fairbanks.

Plates . . .

Plate Prices, Page 131

New York — While voluntary allocations are contributing substantially to the present stringency in plates, some trade leaders believe that the tonnage going into the oil industry for fabricated tank work and larger size pipe is contributing more to the shortage than is generally believed. If the requirements of various industries were analyzed separately, it is claimed, the amount of plates going into the oil industry in one form or another would surpass the tonnage going into each of the others. Railroad equipment demands, which are being handled under special allocation, are sizable although consumption in this field does not show the increase above normal that is true with respect to the oil industry. Shipyard requirements are now on the upward trend, but still represent a small proportion of current plate consumption.

Boston — Carbon plate tonnage this quarter for general use is down sharply; shipyards and other plate consuming industries are getting more voluntary volume, reducing allocation to other fabricators. Demand for floor plate is in excess of supply with price differentials up to $4 a ton exerting but slight influence on buying. Deliveries extend to January and beyond. Tank shops are operating with small inventories, also warehouses.

Birmingham—Plates are moving at a steady rate with production at virtual capacity, but not in sufficient tonnage to meet requirements of the territory. Reports are heard of gray market operations here and there and some plate tonnage continues to move into the district from other points, most of it in small lots.

Seattle—Plate supply is increasingly critical with considerable tonnage idle on strike-bound intercoastal ships. Plants in this area are confining operations to small jobs involving minor tonnages.

Bureau of Reclamation has announced additional awards for the Lewiston Orchards project, Lewiston, Idaho. Steel pipe and fittings went

to Armco Drainage & Metal Products Co., Portland, $10,500 and to American Pipe & Construction Co., Portland, for a steel water tank, $10,300.

Wire . . .

Wire Prices, Page 131

Boston — Rod supply continues precarious with most integrated producers finishing a larger percentage of output. In spots there are easier trends in finished wire, but no slackening in overall demand. Any slack in one direction is offset by overloads in others. Fourth-quarter schedules are filled with users taking in full quotas in most cases. In general, however, consumer inventories are somewhat higher than one year ago.

Birmingham—Wire products seem unable, even this late in the regular farm season, to get abreast of demand. One of the district's largest jobbers said his firm is "hopelessly unable" to supply the retail trade, especially in rural areas, with their requirements in fencing and nails.

Warehouse . . .

Warehouse Prices, Page 133

Pittsburgh — Reduction in fourth-quarter mill allotments to steel distributors is same as for those consumers not coming within scope of voluntary allocation programs. Thus, warehouses are expected to be little or no assistance to metalworking companies seeking to make up reduction in mill shipments through supplementary purchases from warehouses. Cut in mill allotments to distributors has not been uniform productwise. One interest reports reduction in mill quotas on special quality bars is heavier than even sheets. Distributors' inventory positions are getting progressively worse. Considerable rejuggling of mill orders to obtain prompter shipment of "faster moving" items is constantly practiced by distributors. Jones & Laughlin Steel Corp.'s warehouse outlet continues to be only distributor here that has eliminated quantity deductions for 2000 pounds and over.

Cincinnati — Inquiries for warehouse steel are increasing as mill customers, facing reduced quotas, seek supplementary tonnages. Jobbers, under pressure for steel, are unable to meet the demand even to previous degree, as their inventories are unbalanced, with mill shipments tapering. Dearth of flat-rolled is pronounced.

Birmingham — Warehouse steel stocks are the lowest in many months. One of the largest warehouses in the district has received 30 per cent less steel so far this year than for the same period last year. The company has been informed that supplies will get tighter before the end of the year.

Seattle—Wholesale jobbers report a fair demand for all items but the maritime strike has aggravated shortages of essential items. Prices are firm and unchanged and do not seem to have slowed buying. There is a slight increase in the supply of bars, furnished by coast mills, while plates and shapes are in worse position. Sheets are chronically short.

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Pig Iron . . .

Strong price tone develops in Buffalo district as demand continues to exceed supply

Pig Iron Prices, Page 132

Buffalo—Talk about higher prices on pig iron is seeping through the trade here. Increases in prices elsewhere, plus premium prices being paid for foreign iron that has been moving into this area, have stirred up rumblings on the price situation here. Producers are watching for a break in the price structure here. With producers unable to fill urgent requests for iron, foundries are often forced to pay exorbitant prices to stay in business. One sizable plant is on the verge of shutting down because of the iron shortage. Prices, therefore, are secondary to getting deliveries, and any change in prices at this time would have little, if any, effect on business. This tight market situation prevails despite a continued period during which pig iron output has held at 100 per cent of capacity. Offsetting chances of easement in the local market are heavier shipments of iron to Michigan motor casters.

New York—District pig iron consumers anticipate a modest gain in receipts this month. They look for at least one eastern Pennsylvania producer to substantially increase output and for further modest improvement in imports. Imported iron is too expensive to interest many buyers, yet ordering of foreign iron is heavier, especially where consumers can rely on promised shipments and specifications.

While foreign prices are substantially higher than domestic prices, it is realized in various instances foreign producers, as well as those on this side, are operating under severe handicaps in keeping prices within reasonable bounds. For instance, producers in a central European country have to rely on ore from Sweden and Morocco and on coke from Poland and Germany. Labor costs are not particularly high, but for most European producers raw material costs are far above normal. Add transportation costs for shipments to this country to high production costs, and prices such as are now being quoted, $90 a ton and higher at eastern seaboard, are not greatly out of line, it is claimed.

Boston — Shortage in pig iron will be intensified this month; no additional domestic tonnage is in sight until Mystic furnace resumes blast early in November. Some shops have taken in enough foreign iron at premium prices to tide them over and small lots at premiums also have been purchased from one Buffalo stack. Scattered emergency lots also are being shipped by usual suppliers, but tonnage is not large. Outlook for basic is clouded beyond May, 1949, when the Republic-Kaiser agreement terminates. Once Mystic iron is available again, that brand will be the cheapest, $48.75, Everett, for foundry compared with $52.67 delivered Boston at the moment from Buffalo and $54.96, from eastern Pennsylvania.

Pittsburgh — Fact that some foun-

dries are seriously considering the advisability of purchasing foreign pig iron at prices around $80, eastern seaboard, is another manifestation of the critical shortage in that material. Blast furnace output is currently nearly 10 per cent below capacity due primarily to poor quality coal. Foundry operations continue adversely affected by the lack of pig iron and good quality cast scrap, as well as nearly a 100 per cent reliance on inferior beehive coke. Some foundries are charging up to 80 per cent and higher scrap. No significant improvement in iron supplies is indicated for months ahead, although the situation is expected to improve gradually throughout 1949, reflecting installation of coal washing facilities.

Philadelphia — Pig iron prices are strong, although no changes have been announced during the past week. Oven coke prices also are strong at the higher levels established a few weeks ago. Coke supply is now more stringent than pig iron, according to many district foundries. This is due mainly to continued major repairs at one of the district's leading plants and the situation promises to get worse as the fall season advances. Foundry iron supply will improve this month, with the Swedeland, Pa., producer in a position to divert considerably more tonnage to the merchant trade. Imports also are augmenting supplies.

Chicago—Demand for pig iron shows no signs of diminishing in the near future. Foundries continue to press unrelentlessly for tonnage, being forced to schedule melting operations on the basis of receipts. The distribution pattern changes frequently as blast furnaces are taken out for repairs. Latest blowing out is that of Federal A stack of Interlake Iron Corp. at South Chicago on Sept. 15. A three-month idleness is anticipated. Of the district's 43 furnaces, 39 are in operation. Output for sale is restricted by the heavy demand for hot metal for steelmaking. Higher iron prices in the East have brought no reaction here.

Cincinnati — Shipments into this district of northern and southern pig iron have failed so far to rebound to the best levels of the year and are only a fraction of the tonnage received two years ago. Foundries have gone to the feasible limits in use of scrap in the melt. Because of the low foundry operations, supplies of oven foundry coke are a bit easier.

Birmingham — Pig iron supplies, while stringent, are somewhat easier than they were a few months ago. Some help has come from the Republic Steel Corp.'s government furnace at Gadsden. Cast iron pipe producers are using every pound of scrap they can get which also is helping to that extent.

St. Louis — Missouri-Illinois Furnaces Inc., supplier of 90 per cent of this district's pig iron, has dropped two weeks behind in its furnace repair operations. Return to its 1000-ton daily output from the present 500 tons doesn't appear likely before Nov. 1. Allocations to its customers, however, are still being delivered on time, but for many that is not enough. Melters continue to report little success in obtaining iron

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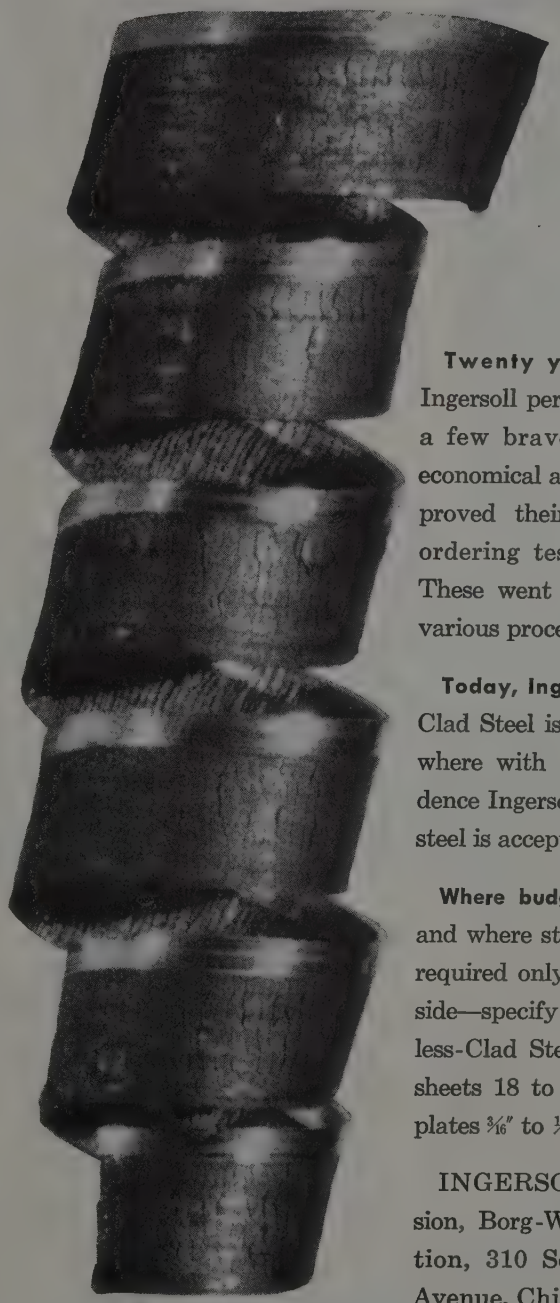

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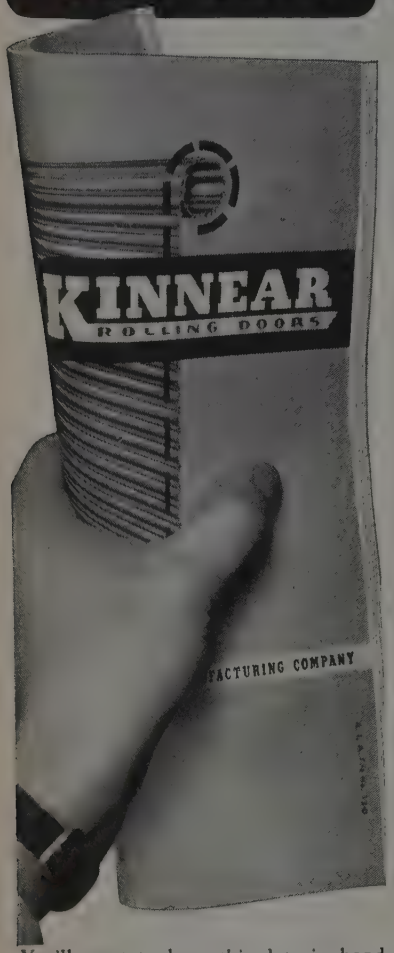

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Los Angeles—Foundries, which are still chronically but not critically short of pig iron in western areas, are being told by suppliers that only a return of the buyers' market, will ease the situation. Industrial people and other experts almost to a man concur in the view that this is still a long way off.

Foundry scrap is a little freer, but not in amounts sufficient to bolster anybody's confidence that the worst is over. Mill buyers apparently are on the inside in the buying of all kinds of scrap and many smaller metal melters are having to scrape and hunt hard for what they get.

Faint hope once bestirred by the idea that when ore began to move from the Kaiser mine at Eagle Mountain pig iron offerings might become freer have faded out in the light of cold reason. Without additional blast furnaces, pig cannot be made any faster than at present, regardless of the amount of ore obtained.

No shipments, of course, have as yet been made from the Eagle Mountain mine. Housing for workers is not yet completed, although the railroad is built and most of the rolling stock is on hand.

Rails, Cars . . .

Track Material Prices, Page 131

New York — Freight car production is now hovering around 10,000 cars a month, or close to the goals set some months ago. The particular difficulty at present appears to be not so much the number being turned out, but the proper balancing of the various types required. A year or year and a half ago much emphasis was placed on the shortage of box cars. Today that shortage has been largely overcome, but meanwhile a scarcity of gondolas and hopper cars has developed, a situation that is being particularly felt by the steel industry.

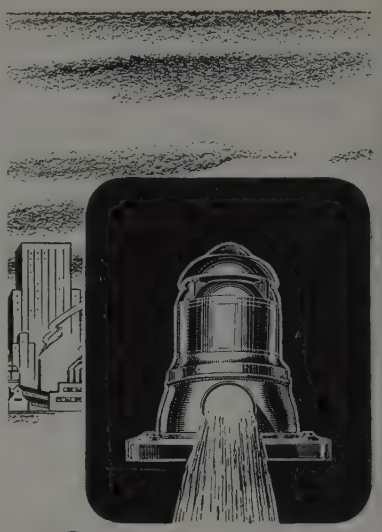
Efforts are being made to strike a better balance, but this may require some time and will probably not forestall an even greater shortage of gondolas and hoppers this winter. One deterrent at present is the higher cost of car construction. Since July, when steel costs advanced sharply, there has been an appreciable slowing down in new orders. August car awards were the second smallest for the year to date and it is considered possible, once all returns are in, that September awards will be lighter than August.

Philadelphia — Pennsylvania Railroad is considering bids on 175,000 tons of rail for 1949 delivery. Last year it asked for 100,000 to 175,000 tons for 1948 and probably has received 120,000 to 130,000 tons so far this year.

Bolts, Nuts . . .

Bolt, Nut, Rivet Prices, Page 131

Pittsburgh — A slight easing in demand for fasteners is reported here, further accentuating the comparatively competitive pricing policy being followed by the industry. Larger diameter items are available from some producers within three to four



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eeks. Deliveries are extended over ree months on cold-headed products, articularly in sizes under 5/8-inch. roducers are fearful that the indi- ated reduction in mill allotments of teel may adversely affect produc- on schedules throughout the fourth uarter.

crap . . .

Scrap Prices, Page 136

Scrap prices show slightly easier tone in Philadelphia area because of good shipments

Philadelphia—While prices on raw naterials required by the steel in- ustry are generally strong, steel crap prices are showing a somewhat asier tone in this district. This is specially noteworthy, coming at a me when scrap consumers are still n the process of building up inven- ories for the winter, even though tocks are in better shape than a ear ago. Fact is that domestic ship- ents are moving freely and this, ombined with an increasing flow of crap from abroad, is causing lead- ng consumers to buy more conserv- tively. Delivered prices on No. 1 eavy melting steel are off slightly to range of $45 to $45.50, with little ow going at a level above the in- ide figure.

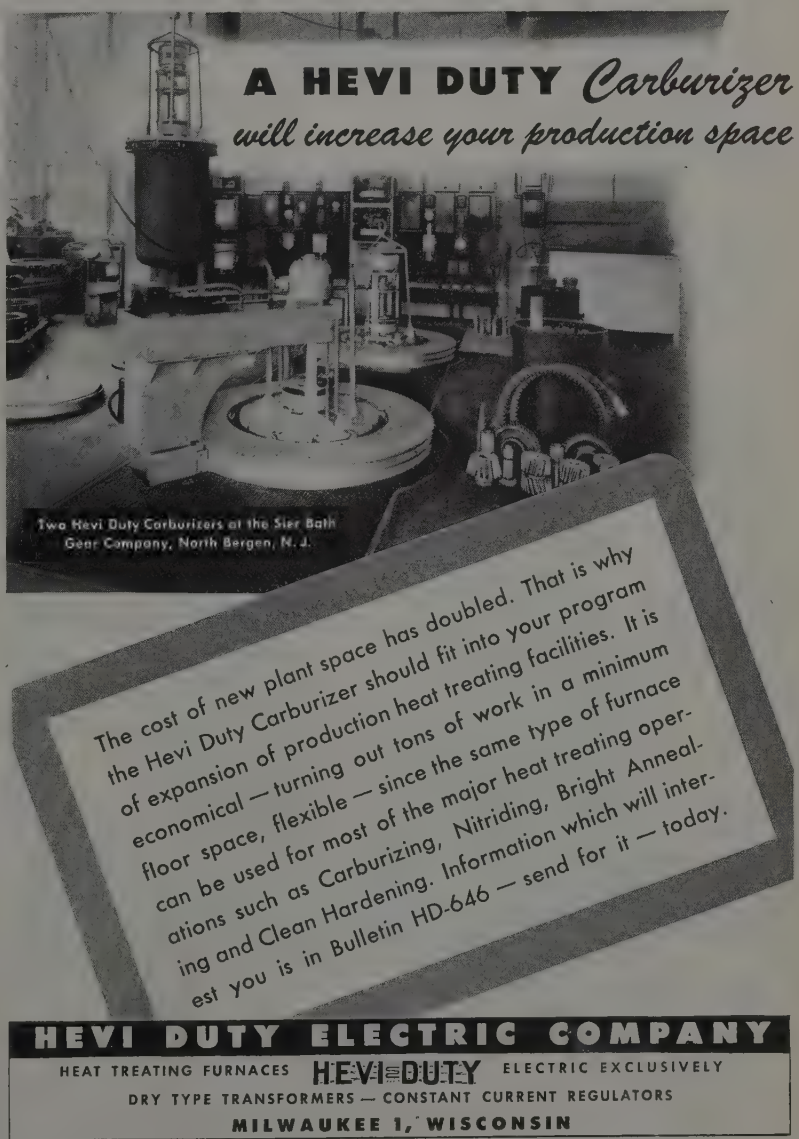
There is also less active buying f low phos and cast scrap, although rices are unchanged. A sustaining actor in the market for prime open- earth steel scrap has been an eas- ng in flow of bundled scrap which as thrown more pressure on No. 1 nd No. 2 heavy melting grades. How- ver, pressure has still not been suf- icient to forestall a drop in No. 1 eavy melting.

The decline in the flow of bundled crap has been due principally to lownright refusal of an increasing umber of consumers to accept in- erior quality that has been coming ut from various quarters. Recently, ome consumers lifted the ban on undled scrap, but in so doing have ssued such grave warnings that some hippers have been scared off and this lso has contributed to easing the low of bundles. However, this par- icular phase should be shortlived, or once guilty pressmen become con- vinced that consumers will no longer accept badly inferior material and, further, will sever future business re- lationships unless better grading is promptly resumed, guilty yards will revise practices and start shipping good material in normal volume again. The only grade on which prices have been increased recently s No. 1 chemical borings, now hold- ng at $46 to $46.50, delivered.

Boston—Cast scrap inventories with more consumers are heavier and buying by these consumers has slackened. On the other hand, most smaller shops are still short of cast. Clean cast still brings in the vicinity of $65 delivered, but melters with more balanced reserves are slow to pay over $60. Industrial scrap drive is bringing out small lots, but has no measurable influence pricewise. No. 2 heavy melting still holds close to the $34.40 formula, but good No. 1 steel scrap moves unevenly at $1.50 to $2.00 above the formula at $38.90. Steel scrap supply has improved some; several thousand tons of German scrap have been offered steel mills, but in one case little interest is displayed with furnaces largely supplied by ship-breaking by the steelworks' own forces.

Pittsburgh — Flow of scrap to mill yards is well sustained with producers reporting moderate inventory accumulations. Prospect of increased foreign scrap shipments has tended to ease pressure for higher prices and mills are more selective in purchasing scrap. Brokers are reluctant to make large tonnage commitments of specific grades unless they have orders on hand for immediate disposal. There is no indication of near term reduction in quotations although most traders believe that the bull market has run its course. Little revision in scrap prices reported in recent weeks with bulk of shipments going at formula.

Buffalo—Scrap market remained deadlocked last week. Some small sales were reported, but when it came to substantial tonnages it was still a case of mills refusing to exceed the formula price and dealers reluctant to accept fresh business at such levels. While a firm undertone gripped the market there was at least one indication, from a leading dealer, that additional contracts will be accepted at the prevailing price of $42.25 a ton for No. 2 heavy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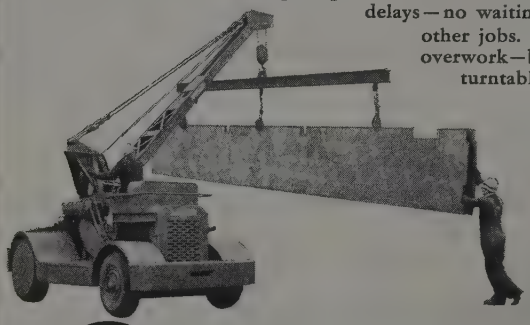

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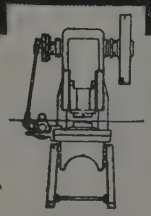

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melting and related items. Dealers obviously are apprehensive over future prices and are fearful of getting caught with tonnage on their books at present prices. Some dealers paid above current prices to cover a portion of their old commitments. In addition, dealers are irked by the confirmed report that one leading mill paid a $2 springboard to obtain scrap from another area. These sales started rumors that the mill was paying $44.25 a ton for No. 2 scrap here.

Also cited as a bullish price factor is feeling in the trade that imports of war scrap are going to fall short of expectations. Then, too, there are still reports of reciprocity deals of a three-corner nature in which fantastic prices are being paid for scrap.

Strength was shown in cast scrap as a leading consumer placed an order for mixed cupola at $66 a ton, a jump of $2.

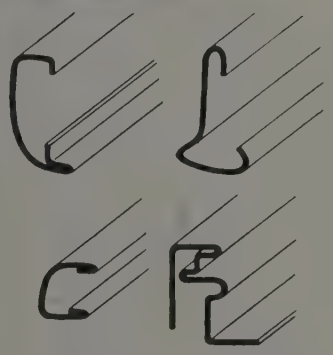
Detroit — Cast scrap is firming in price, current buying ranging from $60 to $65 per gross ton. Demand from the large production foundries supplying automobile engine castings has supplied the impetus. Jobbing foundries, on the other hand, are becoming increasingly cost conscious on materials, as their business has tightened appreciably. Open-hearth scrap is steady at the formula price. Premium sales of No. 1 bundles at the price of electric furnace scrap have disappeared.

Chicago—Despite the fact that steel mills here are operating at 97 per cent of capacity, the highest rate for any week since early June, 1945, they are not pressing for scrap. Receipts are in good volume, and inventories are improved. Mills accept all of the open-hearth material offered, but appear to refrain from any pressure which would tend to strengthen prices. New business is at formula prices. Specialties are not as strong as recently. Foundries are not buying actively, having reasonably good inventories. Dealers are moving their scrap as rapidly as sorted, although collections are not in large volume.

St. Louis—Scrap market here remains extremely dull. The normal fall movement of metal has not started. Dealers who formerly shipped four or five cars of scrap a week are now shipping perhaps one. Mills' hold-out against any prices above formula continues, although they are taking all they can get at that level. Conversion and trade deals are responsible in part for the market lethargy. One instance is reported of plates from an oil tank farm being bought up and rerolled into sheets. Melters generally have a 30-day supply on hand and are able to obtain enough new scrap to stay abreast of daily consumption. Pressure on cast scrap is continuing because of a temporary 50 per cent reduction in local pig iron production, but the increased demand is not yet reflected in prices.

Seattle—Receipts of steel scrap are slightly in excess of consumption which is far above normal levels. The market is firm at $27.50 per gross ton, fob mill, although some sales at higher levels have been reported. Few additional surplus ships are being offered for breaking and this source of supply is expected to be exhausted by the end of 1947. No

ROLLS



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program has been planned for a scrap drive in this area, but it may be necessary as winter weather reduces shipments from the interior. Cast iron scrap is in fair supply, the market firm at $40 to $42. Some eastern interest in both steel and cast iron scrap has been shown, but no large purchases have been reported.

Ferroalloys . . .

Ferroalloy Prices, Page 133

Philadelphia — Ferromanganese prices have been increased by one eastern seller to $162, Johnstown, Pa., and by another seller to $160, Sheridan, Pa. These advances come at a time when increases are being made in various types of ferroalloys.

Anacortes, Wash. — Port of Anacortes and Alwyn H. Wild, president American Chrome & Magnesium Industries Inc., have signed a lease for an industrial site on the waterfront where the leasor plans to erect a plant to produce high grade chromium briquettes. The Port Authority will construct necessary wharves and loading slips. The company is developing olivine and chromite claims in Skagit and Whatcom counties where it is intended to build a 1250-ton concentrating plant. Part of the raw material will be imported.

Wants Copper Tariff Suspended

New York—Pointing out that recent statistics have shown actual consumption of copper in the United States considerably in excess of immediately available supplies, C. Donald Dallas, chairman, Revere Copper & Brass Inc., last week urged the passage of the bill introduced in Congress by Rep. James T. Patterson (R., Conn.) to suspend the copper tariff until Mar. 31, 1952.

Mr. Dallas was a leader in the industry-wide movement which resulted in passage of the bill which suspended the tariff on copper for two years to Mar. 30, 1949, when the tariff will be automatically restored unless the new bill is passed.

Mr. Dallas made his position clear in a letter to the congressman, released because of reports that the copper consumers would favor outright repeal of the copper tariff, rather than a further suspension.

Figures brought out in the letter showed that for six months of 1948, the available domestic supply of copper was 658,000 tons, whereas consumption by fabricators was 712,000 tons. The deficit of 54,000 tons was made up by reduction in fabricators' stocks and releases from the Office of Metals Reserve among other ways, Mr. Dallas declared. The letter continues:

"Since then the Government has announced a current copper stockpiling goal of 30,000 tons and the financing of sales of copper to nations benefiting from the operations of ECA has become a factor. Obviously the reimposition of the tariff under the circumstances now existing, and likely to continue indefinitely, could have no other effect than to place further inflationary burdens on the copper consumer, who has already, this year, had to meet a $40 per ton advance in prices."

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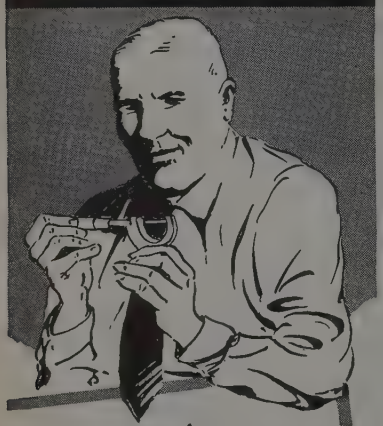

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Canada . . .

Toronto, Ont.—Production of primary iron and steel shapes in Canada totaled 301,478 net tons in June compared with 318,416 tons in May and 253,869 tons in June, 1947. Output for the month under review included 287,752 tons of carbon steel shapes and 13,726 tons of alloy steel shapes. Production for June included 88,372 tons of shapes shipped to producers' own plants or plants within the primary industry for further processing.

Shipments of primary iron and steel shapes for sale during June totaled 220,351 net tons and included 206,873 tons of carbon steel shapes and 13,478 tons of alloy steel shapes; for May shipments amounted to 229,672 tons, including 215,873 tons of carbon and 13,944 tons of alloy steel shapes; and for June, 1947, shipments totaled 188,655 tons including 179,709 tons of carbon and 8946 tons of alloy steel shapes.

Shipments of primary iron and steel shapes for sale during June included 8431 tons of semifinished shapes, 14,576 tons of structurals, 17,827 tons of plates, 34,168 tons of rails, 5019 tons of tie plates and track material, 56,789 tons of hot-rolled bars, 10,718 tons of pipes and tubes, 12,682 tons of wire rods, 20,776 tons of black sheets, 8111 tons of galvanized sheets, 9101 tons of castings, 4700 tons of miscellaneous hot-rolled products and 17,453 tons of all other products.

Of the amount shipped for sale during June, 50,522 tons went direct to railways and railway car shops; 10,843 tons to pressing, forming and stamping plants; 20,177 tons to merchant trade products; 25,698 tons to building construction; 17,024 tons to the containers industry; 11,283 tons to agricultural equipment; 12,254 tons to the automotive industry; 12,698 tons to machinery plants; 3284 tons to shipbuilding; 6688 tons to mining, lumbering, etc. and 2277 tons to miscellaneous industries. Wholesalers and warehousing accounted for 25,484 tons and exports for 22,119 tons.

Casting Prices Rise

CUSTOMERS of Hamilton Foundry & Machine Co., Hamilton, O., have been notified of an increase in casting prices effective Oct. 1. The company cites the fact that in spite of improvements in production facilities, it has not been able to effect enough economies to offset rising costs during the first three quarters of 1948. Individual casting prices are now being refigured.

To Install Electric Furnaces

AT REQUEST of several large consumers, Allegheny Ludlum Steel Corp., Pittsburgh, has agreed to install and operate for them new melting facilities at its Brackenridge, Pa., plant. The new facilities will comprise 3 electric furnaces, soaking pits and auxiliary equipment and

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will be used for production of carbon steel ingots. The melt-shop will be made up of 2 swing-top electric arc furnaces of 70 ton capacity and one furnace of similar construction rated at 60 ton capacity.

The 70 ton furnaces are being constructed by Swindell Dressler Corp., Pittsburgh, and are being purchased outright, while the smaller furnace is being acquired from the U. S. government on a 15 year lease. When producing carbon steel the combined annual rated capacity of the furnaces will be in excess of 300,000 ingot tons.

The furnaces and soaking pits are scheduled to be ready for production during the second quarter next year, being ready for use almost simultaneously with the company's new 40-inch blooming mill.

Cost of the new facilities including rental of government furnace is estimated at about $5.5 million.

The new project is over and above the company's announced 5-year $26 million plant improvement and modernization program, scheduled for completion in 1951.

Four Bid for Open Hearths

FOUR bids to lease the open-hearth section of the government-owned steel foundry in East Chicago, Ind., operated during the war by American Steel Foundries, have been received. Section includes six 30-ton basic open hearths.

Rotary Electric Steel Co., Detroit, which proposes to produce rimmed steel ingots for the automotive industry, estimated production of 15,000 tons a month. Company seeks a 5-year lease at $3.15 per gross ton a month for the first 12,000 tons produced and $3.50 on all production in excess of 12,000 tons, with a minimum guaranteed monthly rental of $37,800.

Glazer Steel Corp., Knoxville, Tenn., estimated production of 180,000 tons a year, offered to lease for five years at $2.88 per gross ton produced or a guaranteed minimum annual rental of $180,000. Glazer would produce ingots for making pipe.

Pittsburgh Mills Steel Co. Inc., New York, seeks to lease for two years with estimated production of 60,000 gross tons a year. Payment would be on terms of $5 per gross ton for the first 10,000 tons produced with a $50,000 annual minimum rental guarantee. An additional $2.65 would be paid for each gross ton to be produced subject to direct maintenance and repair charges.

Portsmouth Steel Corp., Portsmouth, O., offered to lease the facility for three years with rental set at $3

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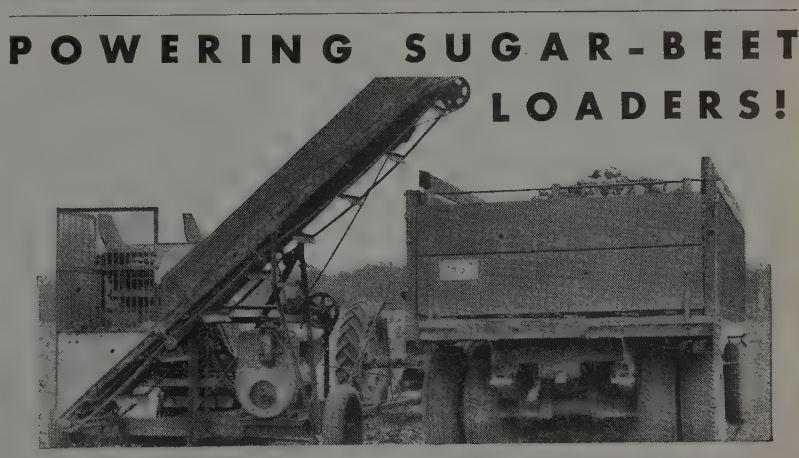
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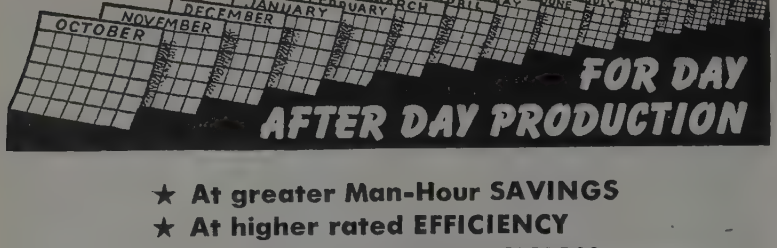

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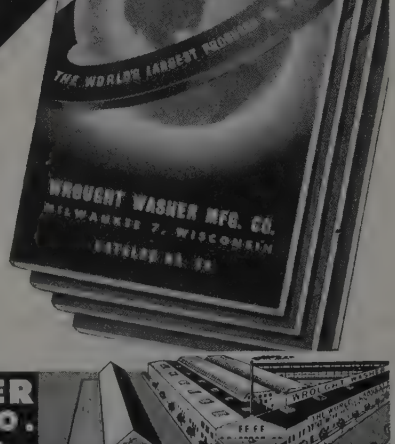

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750 tons, addition, Florsheim Shoe Co. Inc., Chicago, to Inland Steel Co., Chicago; Campbell-Lowrie-Lautermilch Corp., Chicago, contractor.

800 tons, elevators and dock, Continental Grain Co., Chicago, to Inland Steel Co., Chicago; John S. Metcalf Co., Chicago, contractor.

550 tons, North Shore intercepting sewer, cont. No. 7, Chicago Sanitary District, Chicago, to Olney J. Dean Steel Co., Chicago; Paschen Contractors Inc., Chicago, contractor.

303 tons, warehouse, Illinois Bell Telephone Co., Chicago, to Joseph T. Ryerson & Sons Inc., Chicago; William E. O'Neil Construction Co., Chicago, contractor.

183 tons, substructure, air filter and storage buildings, West-Southwest Sewage Treatment Works, Division "Rc", Sanitary District of Chicago, Chicago, to Joseph T. Ryerson & Son Inc., Chicago; Kenny-McHugh Co., Chicago, contractor.

REINFORCING BARS PENDING

2400 tons, Northgate shipping center, Seattle; bids soon.

600 tons, veterans hospital, Miles City, Mont.; general contract reported to Lease & Leighland, Seattle, low $4,170,000.

260 tons, addition, Evanston Hospital, Evanston, Ill.; R. C. Wieboldt Co., Chicago, contractor; bids Sept. 23.

115 tons, state highway bridges, Fairlawn-Glen Rock, N. J.; bids Oct. 14, state highway department, Trenton, N. J.

100 tons, Washington state highway projects, bids to Olympia Oct. 8.

Unstated, concrete gravity diversion dam, Gorge power plant, Skagit project; bids to Seattle Light Department in October.

Unstated, 955-foot National Biscuit Co. plant, Portland, Oreg.; general contract to L. H. Hoffman, Portland.

Unstated, Erb Memorial building, University of Oregon, Eugene; general contract to Ross B Hammond, Portland, low, $1,371,793.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

3000 tons, power house addition, Monongahela Power Co., Riverdale, W. Va., through Sanderson & Porter, New York, to Bethlehem Steel Co.

3000 tons, power plant construction, Consolidated Edison Co., New York, to American Bridge Co., Pittsburgh.

1600 tons, cupola and foundry building, Bucyrus-Erie Co., Milwaukee, to Worden-Allen Co., Milwaukee.

1500 tons, strip mill addition, Alan Wood Steel Co., Conshohocken, Pa., through United Engineers & Constructors Inc., Philadelphia, to Bethlehem Steel Co.

900 tons, manufacturing building, Bucyrus-Erie Co., Evansville, Ind., to International Steel Co., Evansville, Ind.

900 tons, office, Standard Oil Co., Baton Rouge, La., to Ingalls Iron Works, Birmingham, Ala.

870 tons, bus garage, Ulmer Park, Brooklyn, for the New York City Board of Transportation, to Harris Structural Steel Co., New York.

800 tons, hydroelectric plant, St. Marys Falls, Mich., to American Bridge Co., Pittsburgh.

450 tons, building, Canada Dry Inc., Mt. Vernon, N. Y., through A. Barbaresi & Sons, to Bethlehem Steel Co.

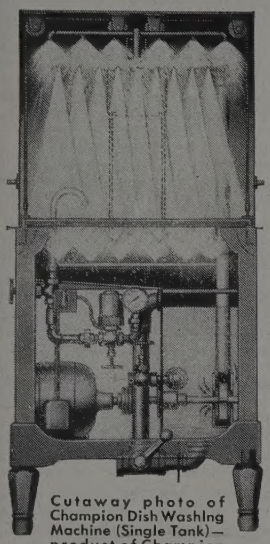
450 tons, service station, Cincinnati Gas & Electric Co., Cincinnati, through Day & Zimmerman, Philadelphia, to Bethlehem Steel Co.

400 tons, Montana state highway bridges, to

DISH WASHING BECOMES A PLEASURE

with

H & K PERFORATED METALS



Cutaway photo of Champion Dish Washing Machine (Single Tank)—product of Champion Dish Washing Machine Co., Erie, Pa.

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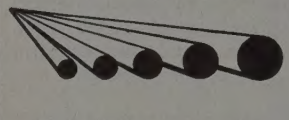
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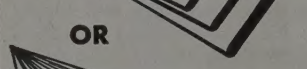
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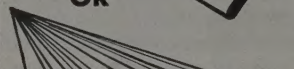
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Pittsburgh-Des Moines Steel Co., Pittsburgh.

370 tons, rack construction, Shell Oil Co., Wood River, Ill., to Bethlehem Steel Co.

280 tons, beam span, coal handling facilities, Commonwealth Edison Co., Savanna, Ill., to Bethlehem Steel Co.

250 tons, Montana state highway bridges, to Bethlehem Pacific Coast Steel Corp., Seattle.

240 tons, telephone building, Lynbrook, N. Y., to Grand Iron Works, New York.

230 tons, factory, New Haven, Conn., through Leo F. Caproni Co., that city, to Bethlehem Steel Co.

224 tons, bridge, proj. S342(3), Gage County, Nebr., for state, to Omaha Steel Works, Omaha, Nebr.

200 tons, sheet piling, power plants in Michigan, to Inland Steel Co., Chicago; Herlihy Mid-Continent Co., Chicago, contractor

100 tons, warehouse, Lee & Cady, Toledo, O., to Bethlehem Steel Co.

STRUCTURAL STEEL PENDING

2000 tons, state grade crossing work, Rockville Center, Long Island, N. Y.; bids Oct. 13.

1200 tons, power plant, Delaware Light & Power Co., Wilmington, Del.; plans expected out for figuring within 30 days.

400 tons, state hospital addition, Mayview, Pa.; bids Oct. 14.

240 tons, state bridge work, Columbia county, New York; bids closed Sept. 29.

230 tons, St. Elizabeth School and Convent, New York; bids asked.

100 tons, addition, Veteran Administration Center, Wilmington, Del.; bids Nov. 9.

Unstated, approaches and rebuilding Washington state Manette bridge, a $750,000 project; bids to Olympia probably in December.

Unstated, four steel spans Cranbrook-Creston road, British Columbia; bids opened by Department of Public Works, Victoria, B. C., Sept. 29.

Unstated, shapes and miscellaneous steel items for Grand Coulee powerhouse; bids to Bureau of Reclamation, Denver, Oct. 14; spec. No. 2420.

PLATES . . .

PLATES PLACED

1080 tons, two tanks, Coastal Oil Co., Port Newark, N. J., to Hammond Iron Works, Warren, Pa.

955 tons, tank work, Texas Co., West Tulsa, Okla., to Bethlehem Steel Co.

135 tons, tank work, Brooklyn Union Gas Co., Brooklyn, N. Y., to General American Transportation Co., Chicago.

110 tons, tank, Staten Island, for New York Edison Corp., New York, to Chicago Bridge & Iron Works, Chicago.

Unstated, pipe and steel water tank for Lewiston Orchards project, Lewiston, Idaho, to Armco Drainage & Metals Products Co. and American Pipe & Construction Co., Portland, Oreg., by Bureau of Reclamation, Denver.

RAILS, CARS . . .

RAILROAD CARS PLACED

Chicago, Rock Island & Pacific, 100 fifty-ton gondola cars to its own shops.

Duluth, South Shore & Atlantic, 100 fifty-ton box cars and 100 fifty-ton gondola cars, to Pullman-Standard Car Mfg. Co., Chicago.

New York Central, 70 passenger coaches, to St. Louis Car Co., St. Louis; these are in addition to 30 placed last June; deliveries will be in September, 1949.

Pittsburgh & West Virginia, 100 fifty-ton steel-sheathed box cars, to Pullman-Standard Car Mfg. Co., Chicago.

LOCOMOTIVES PLACED

Atchison, Topeka & Santa Fe, 21 diesel-electric switch engines, to the Baldwin Locomotive Works, Eddystone, Pa.; order comprises twelve 1000-horsepower locomotives and nine 750-horsepower locomotives.

CONSTRUCTION AND ENTERPRISE

CALIFORNIA

EL SEGUNDO, CALIF.—North American Aviation Inc. has awarded a $428,000 contract to Pacific Iron & Steel Co., 11633 S. Alameda St., Los Angeles, for construction of a warehouse building and shed on Douglas St. including three underslung cranes, canopy over loading dock and bridge crane extension.

LOS ANGELES—Drake Steel Co. has been issued a building permit for construction of a $60,000 warehouse at 2625 E. Century Blvd.

LOS ANGELES—LeRoi-Rix Machine Co., 3817 S. Santa Fe Ave., has been issued a building permit for construction of a $100,000 office building at 6403 E. Slauson Ave.

LOS ANGELES—Steelbrite Co. Inc. has been formed by Herschel D. Phillips, South Gate; Donald D. Matthews, Pasadena; and John H. Phillips, Los Angeles, to manufacture, produce, sell, distribute and handle a certain process or formula to be utilized in connection with various types of metals.

MOSS LANDING, CALIF.—Pacific Gas & Electric Co., 245 Market St., San Francisco, is planning to build a $300,000 steam operated electric generating plant.

PASADENA, CALIF.—Pasadena Welding & Fabrication Co. has been incorporated with a capital of $200,000 by Ralph E. Austin, Burbank; Jerry R. Austin and Eugene E. Bean Jr., Pasadena. It is represented by Dwight H. Reay, 903 Fair Oaks Ave.

SACRAMENTO, CALIF. — Zellerbach Paper Co., 1213 Front St., has awarded a $560,000 contract to Campbell Construction Co., 800 R St., for construction of a plant and office.

SANTA ANA, CALIF.—Socal Iron & Steel Co. has been incorporated in Orange county by John Knox, James B. Utt and Royal E. Hubbard. The new corporation is represented by Utt & Hubbard, 514½ N. Main St.

ILLINOIS

CHICAGO—Clawson & Bals, 2508 S. Michigan St., is planning to build a $300,000 factory and office; A. Epstein & Sons, 2011 W. Pershing Rd., engineers.

CHICAGO—Puritan Co. of America, 3639 S. Ashland Ave., has awarded a $500,000 contract to Poirot Construction Co., 2001 W. Pershing Rd., for a plant and office; A. Epstein & Sons, 2011 W. Pershing Rd., engineers.

CHICAGO—Maremont Automotive Products, 1600 S. Ashland St., has awarded a $100,000 carpentry and masonry contract for a factory to F. Teitelbaum, 308 W. Washington St.; C. Halperin & Assoc., 410 S. Michigan, architect.

IOWA

CLEAR LAKE, IOWA—City of Clear Lake has awarded a $255,000 contract to Dobson Brothers Construction Co., Lincoln, Nebr., for water works improvements to include a water treatment plant, treatment equipment and auxiliaries, and electric wiring; Stanley Engineering Co., Muscatine, consulting engineers.

MOUNT PLEASANT, IOWA — City has awarded a $273,000 contract to C. C. Larsen and Son, 10 N. Main St., Council Bluffs, for an addition to the municipal power plant to include a boiler room and turbine room annex, bunkers and stacks.

OHIO

CLEVELAND—Swift & Co., A. L. Eviston, manager, 3241 W. 65th St., is planning to construct a $500,000 packing plant.

CLEVELAND—National Biscuit Co., 715 Carnegie Ave., plans construction of a $750,000 bread bakery plant on W. 117 St. opposite Western Ave.

CLEVELAND—Veterans' Administration will

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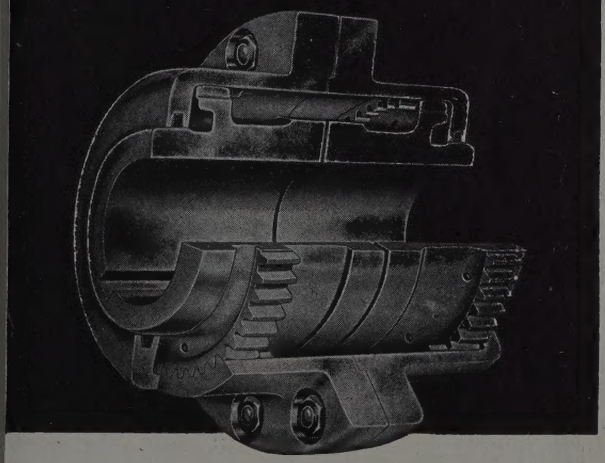

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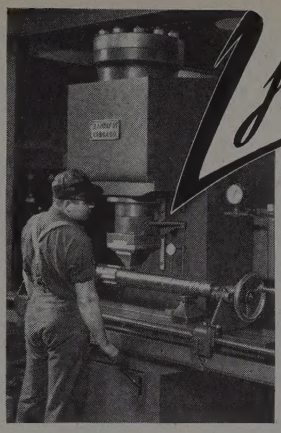

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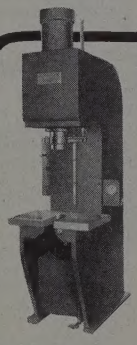

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10 standard models. Capacities from 6 to 150 tons. *Sensitive Pressure Control* standard equipment. Built-in power unit. Stroke adjustable. All-steel welded frame; normalized.

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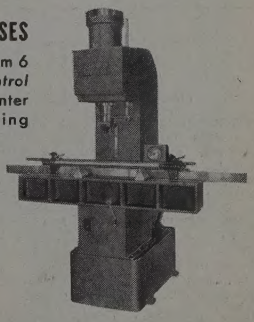

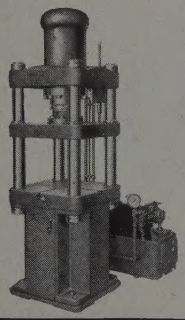

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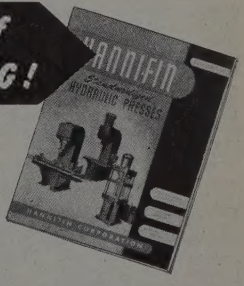

Out of this 20 page catalog on *standardized* Hannifin Hydraulic Presses, it is easy to select the press you need for forcing, straightening, forming, assembling, broaching, and similar operations. Contains detailed information on design and construction and useful engineering data. Ask for free copy of Bulletin No. 130-T.

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PNEUMATIC PRESSES • HYDRAULIC RIVETERS • AIR CONTROL VALVES

build an $18 million hospital for neuropsychiatric patients on land adjacent to Crile Hospital in Parma and Parma Heights.

CLEVELAND—Cleveland Worm & Gear Co., Howard Dingle, president, 3249 E. 80th St., is building a $140,000 factory and office building at 3266 E. 80 St.

CLEVELAND—Lennox Industries Inc., 5927 Euclid Ave., has been incorporated by Sol Reiches, 2111 Lennox Rd., to manufacture electronic devices.

CLEVELAND—Lempco Products Co., James Strnad, president, 5490 Dunham Rd., has purchased Webster Products Co., 1100 W. Ninth St., manufacturer of hones and honing machinery, for about $300,000.

CLEVELAND—Acme Metal Products Co., Emanuel M. Blumenthal, head, 4832 Ridge Rd., is starting construction of a small plant on Brookpark Rd. to engage primarily in aluminum smelting and to manufacture by-products.

CLEVELAND—W. J. Schoenberger Co., W. J. Shoenberger, president, 8810 Harvard Ave., manufacturers of gas valves and fittings for gas appliances, has been sold to Bell Aircraft Co., Larry Bell, president, Niagara Falls, N. Y., for about $2 million.

CLEVELAND—Pesco Products Co., 11610 Euclid Ave., has awarded a $1,500,000 contract to Albert M. Higley Co., 2037 E. 22 St., for construction of a factory, boiler plant and office.

CLEVELAND—Standard Brewing Co., 5807 Train Ave., has awarded a $765,000 contract to Thomas Berry, 17214 Ernadale Ave., for a bottling plant addition to the brewery at 6000 Clark Ave.; J. C. Schultz & Son, 1870 Main St., Buffalo, N. Y., architect.

CLEVELAND—Empire Die Casting Co. has been incorporated by Philip F. Rogel, president, to manufacture aluminum and zinc die castings. The company has acquired the Lawrence Die Casting plant and equipment at 14800 Miles Ave. and intends to purchase some additional machinery including another die casting machine.

SALEM, O.—Mullins Mfg. Corp. George E. Whitlock, president, is planning to build a $200,000 general office building here to provide additional manufacturing space in the main plant.

YOUNGSTOWN—Roll Formed Products Co., J. D. Finnigan, president, Oakdale Ave., Wickliffe, is constructing a plant here where it will install new equipment for the manufacture of roll formed steel specialty products.

YOUNGSTOWN—Ohio Machinery Co., c/o J. R. Lloyd, 433 Euclid Blvd., has awarded a $150,000 contract to M. DeBartolo Construction Co., 216 Alexander Ave., for construction of a sales and service building on Lake Park Rd.

OREGON

PORTLAND, OREG.—Morris P. Kirk & Son Inc., subsidiary of National Lead Co., has awarded a contract to Siminton & Steele for a lead smelter to be erected at 5909 N.W. 61 St.

PENNSYLVANIA

PHILADELPHIA — Cooklyn Milk Co., 338 Dickinson St., has awarded a $500,000 contract to Charles W. Worster, 3617 N. Broad St., for alterations, dairy and milk distributing plant additions, and an office; McCormick Co. Inc., 121 S. Negley Ave., Pittsburgh, architect.

PHILADELPHIA—Cuneo Eastern Press Inc., Erie Ave. & F St., has awarded a $600,000 contract to Robert E. Lamb & Son Inc., 3429 W. Indiana Ave., for construction of a warehouse and bindery; G. W. Woodburn Potter, 321 St. Davids Rd., Wayne, architect.

PITTSBURGH — Graybar Electric Co., 37 Water St., is planning to build a $500,000 distributing plant and office on N. Lincoln Ave.; Hunting, Larsen & Dunnels, Inc., 1150 Century Bldg., architects.

TITUSVILLE, PA.—Universal Cyclops Steel Corp., 701 E. Spring St., has a $300,000 expansion program under way which includes construction of an annealing and rolling mill building and an addition to the ingot storage building.

TENNESSEE

NASHVILLE, TENN. — Moore & Handley Hardware Co. Inc., 712 Fogg St., has awarded a $450,000 contract to Daniel Construction, 822 Seventh Ave., S. Birmingham, Ala., for warehouse and office.

TEXAS

BAYTOWN, TEX.—Humble Oil & Refining Co. has awarded a $3 million contract to Foster-Wheeler Corp., Shell Bldg., Houston, for a pipe still.

DALLAS, TEX.—Lone Star Co., D. A. Hulcy, president, has awarded a $3,500,000 contract to Eastern Construction Co. for a 70-mile pipe line from Opelika to transmission system serving Dallas.

HOUSTON, TEX.—Wright Mfg. Co., 3908 Main St., is planning to build a $2 million factory; M. N. Dannenbaum, engineer and architect.

HOUSTON, TEX.—Gulf Publishing Co., 3301 Buffalo Dr., has awarded a $145,000 contract to Tellepsen Construction Co., 3900 Clay St., for construction of a factory and publishing house.

CANADA

HAMILTON, ONT., CANADA—Austin Motor Car Corp. of Great Britain is planning to build a $500,000 assembly plant addition.

PRICES OF LEADING FERROALLOYS PRODUCTS

(Concluded from Page 133)

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk, 10.00c per lb of briquet, c.l. packaged 10.80c, ton lot 11.6c, less ton 12.5c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.0c per lb of briquet, c.l. packed 10.8c, ton lot 11.6c, less ton 12.5c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 5.75c per lb of briquet, c.l. packed 6.55c, ton lot 7.35c, less ton 8.25c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 5.90c, c.l. packed 6.70c, ton lots 7.50c, less ton 8.40c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c, less ton 22.55c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot, add 0.25c.

VANADIUM ALLOYS

Ferrovanadium: Open Hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5 max.). Contract, any quantity, $2.90 per lb of contained Va. Delivered. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 3.25-4% max., C 0.5-1% max.), $3. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.), $3.10.

Vanadium Oxide: Contract, less carload lots, $1.20 per lb of contained V_2O_5, fob Bridgeville, Pa. Spot, add 5c.

Grainal: Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.). Contract, ton lots, 2" x D, $1.40 per lb of contained Ti; less ton $1.45. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.). Ton lot $1.28, less ton $1.35. Fob Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract, $160 per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21% C 3-4.5%). Contract, $175 per ton, fob Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Contract, 10,000 lb W or more, $2.25 per lb of contained W; 200 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l., lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more. 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered. Spot, add 5c.

Borosil: (3 to 4% B, 40 to 45% Si), $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Contract, ton lot, 2" x D, $2.75 per lb of contained Cb, less ton $2.80. Delivered. Spot, add 10c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Carload, 12 M x D, carload packed 19.0c per lb of material, ton lot 19.75c, less ton 21.0c. Delivered.

Silcaz Alloy: (Si 35-40%, Ca 9-11%; Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Carload, packed, 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 16.5c per lb of alloy, ton lot 17.25c, less ton 18.5c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 42-46%, Ca 5%, Ti 9%). C.l. packed, 16.50-17.00c per lb of alloy; ton lots 17.90-18.00c; less ton lots 19.40-19.50c, fob Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%; V-7, Cr 28-32%, Si 15-21%, Mn 14-16%). C.l. packed, 14.25c per lb. of alloy; ton lots 15.75c; less ton lots 17.00c, fob Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Packed, lump, carload 11c, ton lots 11.25c, smaller lots 11.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Ferrophosphorus (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base): Gross tons per carload, fob sellers' works, Mt. Pleasant, or Siglo, Tenn.; $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.